JPRS 84962

16 December 1983

USSR Report

MILITARY AFFAIRS

No. 1824

AVIATION AND COSMONAUTICS

No. 9, September 1983

FBIS FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service (NTIS), Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semimonthly by the NTIS, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

JPRS 84962

16 December 1983

USSR REPORT

MILITARY AFFAIRS

No. 1824

AVIATION AND COSMONAUTICS

No. 9, September 1983

Except where indicated otherwise in the table of contents the following is a complete translation of the Russian-language monthly journal AVIATSIYA I KOSMONAVTIKA published in Moscow.

CONTENTS

IMPORTANCE OF AF SCHOOL SCIENTIFIC RESEARCH STRESSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9, Sep 83 (signed to press 1 Aug 83) pp 1-3

[Article by Honored Military Pilot USSR Hero of the Soviet Union Col Gen Avn G. Dol'nikov: "Scientific Work at Air Forces Higher Educational Institutions"]

[Text] The role and significance of science in our country's economy and societal affairs were specified by the 26th CPSU Congress: "The Communist Party proceeds from the position that it is inconceivable to build a new society without science." Science has become a powerful productive force. At the same time, as Comrade Yu. V. Andropov noted at the June (1983) CPSU Central Committee Plenum, "unfortunately science has not yet provided necessary practical solutions to a number of important problems, solutions which are in conformity with the principles and conditions of developed socialism."

Successes in accomplishing the constructive tasks facing our country and the nations of the socialist community depend in large measure on external conditions. Militant circles in the leading capitalist countries, headed by the United States, are rattling sabers and holding the world under threat of nuclear catastrophe. In this situation our party's Central Committee and the Soviet Government are doing everything necessary to strengthen this country's defense capability and the combat power of the Armed Forces. A special place in accomplishing the most important defense tasks is occupied by military science, without which, as V. I. Lenin pointed out, it is impossible to build modern armed forces. In conditions of rapid scientific and technological advance, new means of waging war, new weapons and combat equipment are appearing. Growth in military-economic and scientific potential demands of military science thorough research, scientific forecasting in military affairs, and the search for forms and modes of strategic, operational-tactical employment of forces which can decisively influence the outcome of combat operations.

Soviet military scientists, including scientific workers at Air Forces educational institutions, are making a worthy contribution toward solving military-scientific problems. In recent years earnest investigation has been undertaken in the field of art of warfare, in development of arms and combat equipment, and in improving the system of command and control, theory and practice of personnel training and indoctrination. A great many combined scientific research projects have been carried out, with work being done on valuable military-theoretical topics. The results and conclusions obtained from this

research have been put to the test at various field and tactical air exercises.

Qualitative upgrading of aircraft and aircraft armament as well as steady increase in their combat capabilities enhance the role and significance of air in modern combat operations and demand new, innovative search and basic research in the area of combat employment of aircraft.

Considerable work in this area is being done by teaching faculty and scientific staff at the Air Force Academy imeni Yu. A. Gagarin and the Air Force Engineering Academy imeni N. Ye. Zhukovskiy. Well-known scientists, who have established their own scientific trends and schools, work at these academies. They include V. Pyshnov, A. Krasovskiy, Yu. Nechayev, Yu. Dobrolenskiy, V. Tikhonov, S. Belotserkovskiy, G. Molokanov, V. Protopopov, and many other preeminent experts.

The future directions of development of aircraft and aircraft armament have been determined as a result of painstaking work by our scientists, the effectiveness of their combat employment has been increased, and research has been performed on further improving the system of training aviation cadres.

Air Forces higher flight and engineering schools have achieved considerable success in scientific activities. In addition to basic research and development, considerable attention at these higher educational institutions is being focused on applied research, which is conducted jointly with command authorities and line unit specialists. Advanced know-how is thoroughly studied and synthesized, and the line units receive recommendations on how they can master quickly and with excellent quality the combat employment of new aircraft and weapons. As a result of joint participation in preparing guideline documents, line units are promptly provided with textbooks, manuals, and teaching-methods materials. Teaching faculty and scientific staff at the academies and schools take active part in various measures being conducted in line units.

The volume of scientific research being carried out at Air Forces higher educational institutions is steadily growing, and the practical activities of the line units are advancing more and more new, more complex problems which require combined solution. And this in turn presupposes precise coordination of efforts, a high degree of organization of labor, and efficient utilization of scientific potential. In other words, there has arisen the need for bringing close together the scientific and practical activities of aviation cadres. Planning and decision-making for an operation, air combat, airstrike, special combat sortie, organization of force teamwork and coordination, support, command and control, as well as servicing, maintenance and repair of aircraft, ideological indoctrination and moral-psychological training of personnel -- all this demands analysis and substantiations, optimization and employment of forms and methods based on the latest scientific advances.

In addition to basic and applied research, academy scientists assist higher flight and engineering schools in training scientific and scientific-teaching cadres, enlist specialists from these institutions to conduct combined scientific research projects, and help improve the scientific-experimental foundation and work on specific scientific problems. Scientists at Air Forces higher

educational institutions are aggressive propagandists of military knowledge and implementers of scientific ideas. Every year they present lectures and reports in air units and combined units, at training conferences, scientific seminars and conferences, and take part in resolving various teaching-methods problems which arise in the process of personnel combat and political training.

An important component part of scientific work conducted at higher educational institutions is getting enrolled personnel accustomed to scientific research, with the aim of developing a creative thought process in these personnel, the ability independently to pursue scientific search, to synthesize obtained results, to analyze and formulate conclusions and recommendations. This also makes it possible to identify among enrolled personnel capable individuals who can join the ranks of scientific and scientific-teaching cadres. Military-scientific society groups, design offices, and societies of inventors and efficiency innovators have been established toward this end at academies and schools, in faculties and departments, where students take part in scheduled scientific research activities and work on independent topics. In addition, enrolled personnel take part in scientific conferences and seminars as well as various competitions. The popularity of military-scientific work is attested by the fact that more than 80% of enrolled students are members of military-scientific societies. A great deal of experience in organizing military-scientific work among enrolled personnel has been amassed at our academies, as well as at the Kiev and other higher military aviation engineering schools and at the Balashov Higher Military Pilot Aviation School.

Experience indicates that activities in military-scientific societies by enrolled personnel have a positive influence on their mastery of theoretical subject matter. They also do better in methods training and improve their organizer abilities as future commanders and aviation specialists. In the last 10 years, for example, half of the 12 engineering academy students awarded "For Best Student Scientific Work" medals in nationwide competitions have become candidates of technical sciences, while the remainder are doing a good job at Air Forces scientific research establishments and higher educational institutions.

Today, in conditions of intensification of the economy, increasingly higher demands are being placed on quality and effectiveness of scientific research. Advances in science, in military science in particular, are impossible without highly-qualified scientists. Successes and failures are determined in large measure by scientist cadres. Bearing this in mind, command authorities and political agencies at Air Forces higher educational institutions devote considerable attention to preparing doctors and candidates of sciences, who are called upon to conduct thorough theoretical research on important military-scientific problems and ensure practical implementation of research results in the line units. Scientific research results synthesized in doctoral and candidate dissertations are of great theoretical and practical importance for the air forces.

At the same time we must note that sometimes a systemic approach is lacking at higher aviation schools in solving problems of air tactics and efficient utilization of combat equipment and weapons, and scientific research is poorly

coordinated, as a result of which important military-theoretical and military-technical problems are examined in isolation from one another. In addition, due to lack of coordination between Air Forces higher educational institutions and scientific research establishments, sometimes investigation of one and the same problems is conducted in parallel. The relevance and scientific level of research are not always demandingly evaluated. This indicates that authorities at higher educational institutions do not always display a high degree of demandingness toward the content and practical significance of certain military theoretical studies, research projects, and dissertations. Some recommendations to the line units are insufficiently thoroughly substantiated. It is a most important condition for high quality of Air Forces operational and combat training constantly to improve military scientific efforts at higher educational institutions.

The CPSU Central Committee and USSR Council of Ministers decree entitled "On Increasing Effectiveness of Scientific Research Work at Higher Educational Institutions" states: "...It is essential to strengthen supervision of staffs at higher educational institutions and to increase the responsibility of higher educational institution administrators and teaching faculty for the effectiveness and quality of scientific research activities, for improving its organization and extensive recruitment of graduate students and innovatively-thinking undergraduates to scientific research activities. Research activities at higher educational institutions shall be focused on solving the most important problems of the nation's economy..."

The instructions by the party and government have been adopted at Air Forces higher educational institutions as a guide to action. Pursuant to these instructions, the efforts of teaching faculty and scientific personnel are directed toward investigation and elaboration of the most crucial problems of military theory and practice and combat employment of aircraft in various conditions. Our scientists are continuing investigations in the area of improving the training and indoctrination process, are devising higher-quality training schedules and curricula, are producing teaching methods materials, textbooks and manuals, and are improving facilities and the scientific experimentation base at our educational institutions. There still remain a great many inadequately investigated, complex and exceptionally important problems and tasks, which require hard work and a high degree of responsibility for quality and promptness in resolving them.

In the area of military theoretical studies it is essential to concentrate attention on seeking ways to achieve further increase in combat readiness of the Air Forces, their technical equipment, and new modes of combat against hostile air and ground forces in conditions of employment of nuclear and conventional weapons. Scientists must devote particular attention to matters pertaining to preparing for and conducting air operations, organizing air support of ground forces, and effectiveness of joint actions in combat conditions. Air-force theory of operational art and tactics require further elaboration in connection with the increased combat capabilities of aircraft and weapons; the same applies to organization of command, control and support of air combat operations and methods of unit operational and combat training.

Search for and elaboration of measures to increase aircraft survivability in conditions of massive enemy employment of homing weapons, reconnaissance-strike systems and electronic warfare devices is an important area of scientific investigation. Additional, more thorough studies are required in the area of moral-political and psychological training of personnel, particularly aircrews, who perform critical missions in extreme conditions.

Unquestionably the quality of performance of scientific research activities depends first and foremost on skillful planning and organization of these activities. "Economic planning," it was noted at the 26th CPSU Congress, "is the fundamental basis of management. Practical realities dictate the necessity of boosting all planning activities to a qualitatively new level." Analysis of scientific research planning at Air Forces higher educational institutions indicates that in many instances efforts are wasted on trivial topics, scheduled research topics are of little significance or are no longer promising, there occurs duplication of research topics, and sometimes excessively particularized topics are included, topics which are divorced from line unit needs and requirements. Scientific research work should be in conformity with today's requirements and should reflect future needs. Research topic planning should be grounded on a systemic approach in conformity with the missions assigned to the Air Forces and the requirements of air units and combined units.

It is essential to improve the quality of training of scientific-teaching and scientist cadres. This is one of the main tasks of military educational institutions. Mistakes made in awarding a given teacher or scientist the academic degree of doctor or candidate of sciences are especially costly today. The author of a sterile and useless idea and a person who has received an academic degree for a weak dissertation, and in addition a person of a weak moral countenance can cause not only moral but material detriment, substantial damage to the indoctrination of cadets and other enrolled personnel.

It is highly appropriate at this point to quote V. I. Lenin's appeal to students enrolled at the Capri School: "The most important thing in any school is the ideological-political directional thrust of the lectures. What determines this thrust? Entirely and exclusively the makeup of the lecturers.... No oversight, no curricula, etc are capable in the slightest of altering that directional thrust of classes which is determined by the makeup of the lecturers."

This statement is valid today as well. Thus specialized councils, school authorities, political agencies, and party organizations at military educational institutions must tirelessly monitor the subject matter of scientific quest and its special significance, must be highly principled and demanding in awarding academic degrees, and must display intolerance toward superficial and nonobjective conclusions on the part of departments and officially designated thesis opponents. Demands on dissertations should be continuously rising and conform to the present state of science. Permission should be given to write and defend only those dissertations which are of scientific and practical value. Only those graduate students and degree candidates who possess thorough professional knowledge and scholarly achievements, who possess great military and cultural intellectual breadth, who possess a mastery of Marxist-Leninist theory, who have proven themselves in performance of their military duties,

in scientific and civic affairs, who follow standards of Communist morality, and who possess excellent moral-political and professional qualities should be permitted to submit and defend dissertations.

The quality and effectiveness of scientific research activities depend to a considerable degree on proper utilization of the scientific potential of a military educational institution. Administrative officials at Air Forces higher educational institutions must efficiently distribute scientific manpower in order to ensure that research activities conform to the nature of the scientific-teaching activities of the instructor or scientific staff member, corresponding to his inclinations and abilities. One should draw attention to the fact that for many years now some scientists have not been working at full effort, and in some cases have gone for years without taking part in scientific research. Each and every instructor should actively conduct scientific research work, for otherwise he will be unable innovatively to teach and indoctrinate enrolled personnel.

Follow-through and labor discipline on the part of scientific workers are of particular importance for improving scientific work at military educational institutions. It is a matter of honor for each and every scientific staff strictly to observe scheduled timetables for completing, preparing for presentation and submitting to the client completed projects and interim reports by project participants.

It is essential constantly to establish firm ties with line units, with other higher educational institutions and scientific research establishments of the Air Forces and other armed serves, as well as with this country's scientific centers. Without this it is impossible successfully to advance military aviation science. Air Forces higher educational institutions employ various forms of communication with line units: teaching faculty and scientific staff take part in various exercises, leader personnel training conferences and scientific-practical conferences, present lectures on special topics, conduct classes and seminars, and prepare teaching manuals and study guides.

It is essential to ensure that manuals and study guides are published on schedule, possess substance and cogency, are comprehensible and well-structured. They should contain all new developments presented by military-theoretical thought. Departments in turn should constantly and persistently utilize, in a prompt and timely manner, the advanced know-how of line units, incorporating it into the teaching process, and at the same time ensure verification of scientific research results at exercises, incorporating them into the practical combat activities of units. The June (1983) CPSU Central Committee Plenum once again directed the attention of our country's scientists to the further development of Soviet science: "Tens of thousands of industrious individuals who are dedicated to the party and people are working in our science. They represent a great resource. The party is confident that Soviet scientists will continue in the future devoting their entire knowledge and their entire talent to serving our socialist homeland." The Plenum's demands on scientific research include the concrete tasks facing military scientists.

Military aviation science has highly-qualified scientific cadres at its disposal. They are making a worthy contribution toward strengthening the combat power of the Air Forces. And there is no doubt whatsoever that the tasks facing them will be successfully accomplished.

3024
CSO: 9144/0035

FIGHTER-BOMBERS DELIVER GROUND-SUPPORT AIRSTRIKE

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9, Sep 83 (signed to press 1 Aug 83) pp 4-5

[Article, published under the heading "For a High Degree of Combat Readiness," by military pilot and expert marksman Lt Col A. Mikhaylov: "Supporting Ground Troops"]

[Text] It is not difficult to "hide" flaws in the individual proficiency of pilots, technicians, and aviation specialists at final performance tests and inspections against the background of overall success, but one cannot hide them from oneself. The actual combat readiness of a subunit and unit depends in large measure on how well its commanding officer realizes this fact and how effective are the measures he takes to correct deficiencies. As the operation of a new aircraft is mastered, the individual skill of the pilots and specialists increases, as does the the combat efficiency of the entire collective. Skillfully applying the principle of sequence in teaching and learning and properly combining drills taking into account the abilities of each subordinate, commanders as a rule make them ready in short order to conduct combat actions in various conditions, day and night. And it is quite natural that each leader endeavors to bring his combat collective to the specific performance level as quickly as possible.

Unfortunately not everything and not at all times are things as required by flight training method. Deviations from rules and regulations sometimes lead to undesirable consequences. It sometimes happens, for example, that a commander schedules a more complicated drill for one of his men, while the latter has not yet adequately mastered the preceding drill. Some commanders, their attention taken up by daily routine, forget to apply a combined approach to aviator personnel training and indoctrination and ignore their tactical training. As a a result a pilot, as he advances through the training program, fails to expand his tactical knowledgeability and feels constrained in a situation maximally approaching actual combat.

Our unit's methods council constantly bears these points in mind. At meetings recommendations on improving tactical-flight training are formulated. Take, for example, the very important matter of subunit cohesiveness and precision formation flying. The principal mission of fighter-bombers is support of ground troops, in other words operation very close to the ground. In connection with

this there are specific features applied in organizing the training process. In order to develop a cohesive, smoothly-coordinated, combat-capable team, for example, it is necessary first to make up the 2-aircraft elements and the flights in a thoughtful manner, to ensure that the pilots feel relaxed in the air, able to anticipate each other's actions. The most important things here are professional and psychological qualities. This is followed by commencement of drills and training flights for group formation flying in various formations. Here too can be found a unique reserve potential for achieving savings, and an area for application of commander's innovativeness. If, in addition to the pilots' mutual desire to fly with one another, he considers their qualities of character and personality, this not only will reduce material expenditures but will also shorten the time required to train pilots to conduct combat actions.

After acquiring skills in flying in formations of 2, 3, and 4 aircraft, pilots proceed to work on mutual fire support and coordination. During this period flight leaders work on acquiring skills of controlling their flights in the air. The tactical background becomes increasingly complex with each new drill and exercise, and different variations of strike delivery are rehearsed at a familiar gunnery range. Initially they are discussed at tactical drills and brief exercises. It is notable that each flight leader substantiates a proposed maneuver and independently formulates the procedure of teamwork and coordination in the 2, 3, and 4-aircraft flight at various phases of a mission. As a result the optimal variation of strike delivery in given conditions is chosen collectively.

Of particular importance for the fighter-bomber is precise organization of coordination with ground subunits and other air branches. An important role here is played by efficient work by the headquarters staff. The tactical situation at exercises is constantly changing, and success in accomplishing a mission assigned to aviation personnel depends entirely on how precisely the situation is worked out on maps by staff officers and how quickly changes are communicated to subunit commanders and aircrews. Detailed elaboration of coordination and target designation signals, marking the "line of contact" and friendly troops ensure that an aircrew heads for the target with precision and knocks it out.

Here is an example. An exercise was in progress. The "aggressor," pressing the defending force, dug in along an advantageous line. The commanding officer decided to send out a group of fighter-bombers to knock out the enemy's tactical missiles and to drive him off the high ground with an unexpected attack by ground subunits.

A group under the command of military pilot and expert marksman Lt Col Yu. Tyumin prepared thoroughly for the mission. According to intelligence, the missile positions were deep in the "aggressor's" defense and were defended by a solid air defense system, as was the forward edge of the battle area.

Studying the area of operations on the map, Lieutenant Colonel Tyumin marked the "aggressor" air defense weapons detection and impact zones. He noted that "blind" areas were possible in some sectors, which could be utilized to conceal the attacking aircraft. He shared his observations with his men. They began

looking for an optimal variation, and soon a dashed line was placed on the maps. They quickly computed the route and checked calculations -- everyone had it down precisely, with no discrepancies.

During this time engineers, technicians, and armorers were on the flight line, readying the fighter-bombers for the mission. Time was moving ahead swiftly.

Nor was the "aggressor" standing idle. Headquarters received information that he had redeployed his tactical missiles. Reconnaissance personnel succeeded in determining their location at several dozen kilometers from their previous position. This information was promptly communicated to the pilots of Lieutenant Colonel Tyumin's group. The scenario change did not catch them napping. Estimating the current situation, they again proceeded to make calculations. They were running out of time. They decided to employ the main variation with a course correction in the final phase. Air defense penetration was to be as planned, since the antiaircraft missile systems had remained in their positions; penetration would be followed by a swing to the right, coming out onto the bend in the canal, from which it was a mere stone's throw to the target, as they say. They would strike without a pause, followed by a second pass. If the "aggressor" spotted aircraft to his rear sooner, he would simply not have time to deliver fire on them -- everything had been checked down to the second. The main thing was to spot the target. But this was no simple matter, particularly since the weather was constantly changing.

A haze was presently obscuring the horizon, and the taiga-covered coniform hills seemed to dissolve in the haze. Lieutenant Colonel Tyumin decided to proceed into the target area in an extended formation. On the final route segment each pilot would look for the target independently. Following the second target pass, the following 2-aircraft flight would head for the target. The bomb bursts would indicate target location.

The fighter-bombers took off on schedule. They passed the descent point. The aircraft proceeded nap-of-the-earth. Hilltops flashed under their wings, and orientation was becoming more difficult, but there were no deviations from the ground track. Radio silence was maintained.

Avoiding dangerous areas, the two aircraft were approaching the check reference point. The conspicuous curve in the rail line flashed past, as did a village. They reached the "line of contact." The next instant Tyumin saw smokes on the ground, marking the "forward defended localities." He glanced at his stopwatch -- precisely as calculated. The motorized riflemen were also operating with precision.

Gaining his bearings, the flight leader swung right, and soon the fighter-bombers were above a lake surface. The canal lay ahead. The pilots closely scrutinized the ground. The bend in the canal. The aircraft executed a turn; they should be at the target in 30 seconds.

The aircraft proceeded to climb. Now they had to spot the missiles, and the sooner they did so, the more accurate the strike would be. Seconds counted. What helps a pilot the most at such a moment? Intuition, experience, knowledge,

skill? All these things together! Years of work and practice, compressed into a few seconds, result in a lightning-swift, sure strike. The pilot invests so much work and effort on the ground precisely for this.

A rocky precipice. A road led away from it through the taiga. To the right a ravine with gently-sloping sides. According to intelligence, the missile position was somewhere here. Lieutenant Colonel Tyumin glanced left. Against the background of the taiga, he spotted a stand of young forest at the foot of a hill, and missile launchers at the forest edge. The experienced pilot needed only a few seconds to choose the optimal maneuver. He abruptly swung his aircraft and initiated a dive. He sighted on the command post.... Making a correction, the pilot then pushed the release button. As soon as the flight leader disengaged, Maj V. Moskalevich hit the launchers. Flame and smoke shot skyward. The two aircraft swung back around and flew a second pass.

By this time the 2-aircraft flight led by Maj A. Rogozhkin arrived. He and Capt V. Avramenko released bombs, completing destruction of the missile launchers. Mission accomplished.

Returning back across the "line of contact," the pilot saw the motorized riflemen launching an assault.

Analyzing the pilots' performance, senior-level officers noted their high degree of professional expertise, firm moral-psychological conditioning, and their ability to act as circumstances require, even in the most complex situation.

Maximum results can be achieved with minimum expenditure only if subordinates fully understand the commander's plan, clearly picture the sequence of action at any phase of a mission, and perform intelligently and with initiative in combat. The thoughts of a pilot who possesses consummate mastery of today's combat aircraft and who thoroughly understands tactics will not be employed with determining what should be done and how in a given situation, but will be focused on a single goal: how to execute the commander's order more effectively. Knowledge and experience will tell him what device to employ at this moment.

Work on the ground day after day, painstaking work, without allowances or indulgences, constitutes a guarantee of precision performance in the air, a guarantees of professional growth and growth in performance of one's job.

3024
CSO: 9144/0035

IMPORTANCE OF IDEOLOGICAL INDOCTRINATION STRESSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9, Sep 83 (signed to press 1 Aug 83) pp 6-8

[Article, published under the heading "Excellent Quality and Effectiveness to Ideological Work," by Col Gen Avn L. Batekhin, military council member, chief of Air Forces Political Directorate: "Business of the Entire Party"]

[Text] Our Leninist party, performing grandiose tasks of building communism, is tirelessly concerned with mobilizing the spiritual energy of Soviet citizens with purposeful and effective ideological work, boosting their labor and social activeness. A vivid manifestation of this concern was the June (1983) CPSU Central Committee Plenum, which discussed current problems of party ideological and mass-political work in present-day conditions. The plenum gave a positive assessment of work being done by party organizations to improve indoctrination and propaganda in conformity with the decisions of the 26th CPSU Congress and the CPSU Central Committee decree of 26 April 1979.

Soviet citizens and the fighting men of our valiant Armed Forces are living and working today under the indelible impression of the proceedings and decisions of the CPSU Central Committee Plenum and the 8th Session of the USSR Supreme Soviet, 10th Convocation. They enthusiastically and unanimously approve of election of CPSU Central Committee General Secretary Comrade Yu. V. Andropov chairman of the Presidium of the USSR Supreme Soviet and support the new and important foreign-policy actions taken by this highest agency of governmental authority of the world's first socialist country.

The decisions of the Plenum and session are viewed not only in this country but abroad as well as events which are of paramount significance for world politics. The lively interest shown toward them reflects the enormous international reputation and prestige of the party of Lenin and of the country of the Great October Revolution. The peoples of our planet link with them their hopes for peace and a bright future.

Carefully reading these important political documents, each of us Communists once again becomes convinced that the principal meaning and root content of CPSU activities comprise concern for the Soviet citizen, for improving his life, his comprehensive development, and the creation of peaceful conditions for accomplishment of his historic mission -- that of building a Communist

society. Our party proceeds from the position that the forming of a new man is not only a most important goal but also an essential condition for further advance toward a bright future.

Presently, however, mankind is going through a complex and troubling period in its history. As USSR Minister of Defense MSU D. F. Ustinov, member of the CPSU Central Committee Politburo, stressed in his speech at a meeting of USSR Ministry of Defense party activists on 21 June 1983, the historical period which mankind is presently going through is characterized by an acute and intense contest between two opposing social systems, two political courses, two ideologies -- socialism and capitalism. Imperialist reaction, and particularly the U.S. ruling elite, is nurturing insane ideas of world domination and is pushing markind to the edge of a nuclear catastrophe with its aggressive policy.

Under the pretext of the notorious "Soviet military threat," the United States and its NATO allies have set for themselves the goal of breaking the military-strategic equilibrium which has been established between the two sociopolitical systems and tipping the balance in their own favor, and they do not conceal their plans to destroy socialism.

In contrast to the sinister, adventuristic policy of imperialist circles, the society of genuine socialism, led by the Communist Party, holds high the banner of peace, the banner of human rights. Marxism-Leninism and socialism are inseparable from the ideals of disarmament, friendship and peaceful cooperation among peoples. Evidence of this includes the entire history of our country's Leninist foreign policy and a broad aggregate of new, recent constructive Soviet initiatives and proposals to curb the arms race. "...The question of preserving peace on earth," noted CPSU Central Committee General Secretary Comrade Yu. V. Andropov in his address at the June (1983) CPSU Central Committee Plenum, "is both today and in the foreseeable future the pivotal problem of our party's foreign policy.... Communists always have fought man's oppression and exploitation by man, and today they are also fighting to preserve human civilization, for man's right to life."

But what did the world hear during those days in June from the opposite political pole? Did it also hear about a program of peaceful construction or a plan for lessening military confrontation, for restricting the unchecked arms race? No! Events of a quite specific kind occupied the center of attention of U.S. political life during those days: urged on by the Reagan Administration, the U.S. Congress approved commencement of deployment of the new MX missile.

On the other hand aggressive imperialist circles unleashed against the Soviet Union and the entire socialist community "psychological warfare" which was unprecedented in scale and shamelessness. The ideological struggle against socialism has become today an organic component of government activities by the imperialist powers and is viewed by their ruling clique as a "fourth domain" of foreign policy, alongside diplomatic, military, and economic.

In these conditions the Communist Party considers its main task to be that of raising our ideological, indoctrination, propaganda work to the level of those large and complex tasks which are being accomplished in the process of perfecting developed socialism. Forming the consciousness of Communists and all the

members of our socialist society is a task not only of ideological workers but, as the CPSU Central Committee Plenum specifically noted, the business of the entire party.

The proceedings and decisions of the Plenum have armed the CPSU and all its ideological establishments with a clear-cut program and methodology of action, meeting the demands of the present time. They are being studied with enormous interest in military units as well, and this is logical.

Successful accomplishment of the tasks assigned to the Armed Forces by the party presupposes a continuous increase in efforts by commanders, political agencies and party organizations to boost the political awareness of personnel and to form in them ideological conviction and moral maturity. In conditions of an increasingly complex international situation, the ideological, mass-political work being conducted in the military has become an important factor in increasing their spiritual potential. It arms personnel with a correct understanding of CPSU domestic and foreign policy, the phenomena and processes of contemporary reality, the ability to appraise them from a class position, and teaches one more clearly to see the aggressive aspirations of imperialism and to understand one's place and role in defense of the socialist homeland.

Guided by the demands of the 26th CPSU Congress and the June (1983) CPSU Central Committee Plenum, and the directive of the USSR Minister of Defense and chief of the Main Political Directorate of the Soviet Army and Navy dated 18 June 1983, Air Forces political agencies and party organizations are doing a great deal to improve ideological and mass-political work. The intellectual life of party organizations has become more diversified and richer in content. This was assisted by celebration of the 60th anniversary of establishment of the USSR, preparations for celebrating such events as the 165th anniversary of the birth of K. Marx and the 100th anniversary of his death, and our party's 80th anniversary, CPSU Central Committee decrees issued in connection with this, plus other documents.

Their study has raised the ideological-theoretical level and increased the practical thrust of all ideological and mass-political work in line units, particularly Marxist-Leninist training of officers, political instruction for warrant officers, political indoctrination classes with enlisted personnel and NCOs, and party education. On this foundation, aviation personnel have gained increased responsibility for implementation of tasks assigned by the USSR minister of defense pertaining to boosting Air Forces combat readiness. The majority of aviation combined units and units are successfully accomplishing combat and political training plan targets.

Cadets and other enrolled personnel at Air Forces academies and higher educational institutions completed the academic year with good results. A new detachment of ideologically mature aviation cadres, who are dedicated to the party and people, and who are well prepared in an ideological and professional regard, has been added to the ranks of the officer corps.

Implementing the decisions of the 26th CPSU Congress pertaining to increasing effectiveness of ideological indoctrination and mass-political work, and the

demands of the June (1983) CPSU Central Committee Plenum on this matter, Air Forces military councils, commanders, political agencies, party, trade union and Komsomol organizations are innovatively approaching this matter of state importance and are successfully searching for new forms and methods of indoctrinating personnel.

To be quite honest, however, we must note that only the first steps have been taken in this important and necessary area of activity. Evaluating the state of ideological and mass-political work from the standpoint of the demands of the June (1983) CPSU Central Committee Plenum, we must admit that the attained level is unsatisfactory. We have not yet succeeded in properly restructuring the consciousness of a certain segment of personnel to the level of today's demands, taking into account the more complex international situation and current tasks assigned by the party to the Soviet people and their Armed Forces. Air Forces political agencies and party organizations must raise to an even higher level the ideological force of all indoctrination measures, strengthen their influence on people's minds and hearts, and instill in propagandists the ability to motivate them to action for the sake of lofty ideals and aims.

Continued persistent and consistent implementation of the demands of the CPSU Central Committee on unity of ideological-political, military, moral and legal indoctrination of aviation personnel, fully embracing all categories of personnel and with skilled coordination of all means of ideological influence, should be the main directional thrust in this work. I believe it is useful in this connection to make fuller use of experience in ideological-indoctrination and mass-political work amassed during the period of preparation for and celebration of the 60th anniversary of establishment of the USSR and the 40th anniversary of the remarkable victories of the Soviet people in the Great Patriotic War.

In present-day conditions it is extremely important that each and every airman thoroughly understands his role in defense of the homeland, that he is cognizant of his personal responsibility for strengthening the homeland's defense capability, for the fate of genuine socialism and life on our planet. This is why forming in Air Forces personnel a constant readiness and willingness resolutely to repel aggression from any quarter is a central task of military councils, commanders, political agencies, party and Komsomol organizations, of all ideological cadres.

Recently considerable interesting experience has been amassed in the line units on increasing the effectiveness of ideological, mass-political work in aviation units and subunits. In particular, such experience is possessed by the propaganda and agitation departments of the political agencies headed by Comrades V. Girenko, V. Moskvitin, G. Smeshkov, N. Buyanov, and others. They thoughtfully plan and aggressively implement ideological measures of counter-propaganda content, tailored for various categories of military personnel. Principal attention is focused on shifting the center of ideological, mass-political work directly into the companies and air squadrons. I believe this is a correct course to take, for it is in keeping with the demands of the CPSU Central Committee decree of 26 April 1979, the decree issued by the June (1983)

CPSU Central Committee Plenum, and the recommendations of the 6th Armed Forces Conference of Primary Party Organization Secretaries.

Practical realities insistently demand that we employ all forms and means of ideological-indoctrination work in order resolutely to combat the ideological sabotage of imperialism, relapses of petit-bourgeois psychology, and the antipodes of Communist ethics and morality. In the struggle against them it is essential to make fuller use of the force of party influence, community activeness, and awareness of inevitable answerability to Soviet laws.

It is advisable to combine ideological-political indoctrination work with organizational measures directed toward increasing the social significance of the military labor of Air Forces personnel, at forming in aviation personnel of all categories an active attitude toward life and excellent ideological-moral qualities. Political agencies and party organizations should work more resolutely to strengthen the link between ideological and mass-political work with Air Forces daily life and tasks, and more fully to implement the indoctrinational capabilities of military units for developing in aviation personnel a conscientious attitude toward carrying out the demands of the military oath and military regulations, toward strict, precise observance of documents governing mishap-free flight operations.

It is essential to work persistently to improve the forms and methods of Communist indoctrination of Komsomol members and all young military personnel, directing their energy and creative productivity toward high-quality accomplishment of combat and political training tasks and skilled mastery of aircraft and weapons. The main emphasis thereby should be placed on achieving more active individual indoctrination work with young officers and warrant officers.

In order to increase ideological influence on Air Forces personnel, the possibilities of oral propaganda and agitation should be more extensively utilized. A correct job is being done wherever these capabilities are being skillfully utilized for lively, trusting communication between party member leader personnel, staff and volunteer propagandists on the one hand and the soldier masses on the other, frank discussion of those issues and problems which are of concern to them. As is demanded by the directive issued by the USSR minister of defense and chief of the Main Political Directorate of the Soviet Army and Navy, regular talks and discussions directly in the subunits are a most important duty on the part of all command-political and engineer cadres. At the same time party organizations must keep under strict party oversight the implementation of comments and suggestions by military personnel, Soviet Army civilian workers and employees, promptly responding to their needs and requirements.

In performing ideological, mass-political work in the units, political agencies and party organizations should bear in mind the complexity and conflictive nature of the present international situation. In connection with this it is necessary thoroughly and comprehensively to explain to personnel the Leninist foreign policy of the CPSU, the peace initiatives of the party and Soviet state, directed toward preventing a nuclear-missile world war, consistently and persistently to expose the aggressive intrigues of imperialism, and persuasively to reveal the antipopular essence of its policies, ideology, and morality.

Particular attention must be focused on showing the reactionary essence of present-day imperialist armies, their ideological and moral depravity, their adventurism, sadism, and cruelty.

In present-day conditions it is particularly important further to improve the moral-fighting and psychological qualities of the air defenders of the homeland, their practical readiness and willingness to fight aggressively to defeat a powerful, well-equipped, crafty foe. In this connection it is desirable to make greater use of the opportunities offered by Officers' Clubs, enlisted personnel club facilities, and libraries.

Improvement of training and retraining of ideological cadres and increasing their responsibility for the assigned job continues to be an important task. Practical realities demand that ideological activists be armed with practical work experience, with the ability to select those forms and methods which are in fullest conformity with the present situation. At training conferences and seminars for staff and volunteer propagandists it is advisable to teach them the ability to talk to people in a lively and interesting manner, to convince and lead people, and it is necessary to inform ideological cadres on a regular basis about events at home and abroad, on current problems of CPSU policy, on aspects of military organizational development, and on the specific tasks assigned to aviation units and subunits.

A great deal is being done by political agencies and party organizations in the area of improving the system of political instruction and party education. But available reserve potential and capabilities in this important area have not yet in all cases been mobilized. In some Air Forces units and subunits certain group leaders have failed to transform the knowledge possessed by trainees into firm political convictions and are not seeking ways to increase the effectiveness of class sessions. Excessive attention to form and assignment of excessively high marks have not yet been corrected, which has a negative effect on people and dulls their feeling of responsibility for performance of their military duty.

It is not surprising that the party Central Committee considered it necessary to alter the work style of the party education and mass political instruction network. Attention was focused on all-out development of active forms of instruction classes and toward giving them greater practical thrust. Comrade Yu. V. Andropov stressed in his speech at the Plenum that the significance of political instruction consists in each individual gaining a deeper understanding of party policy in present-day conditions, in being able to apply acquired knowledge in a practical manner, and more clearly understanding one's own duty and carrying it out in a practical manner. Expressed in these words is one of the principal tasks of Air Forces commanders, political agencies, party and Komsomol organizations pertaining to increasing the effectiveness of officer Marxist-Leninist training classes, warrant officer political instruction classes, and political instruction classes for enlisted men and NCO personnel.

Cultural-educational work requires substantial improvement. This important area is not yet being adequately influenced by political agencies and party organizations, and at times it is totally ignored in party-political work plans.

Primary party organizations, as the vanguard force and political nucleus of military units, play a very important role in improving quality and effectiveness of ideological, mass-political work, in strengthening its influence on accomplishing combat and political training tasks and on strengthening organization and order in the units. Party committees and bureaus should closely and thoroughly examine all areas of practical ideological activities, especially as regards matters of ideological conditioning and moral indoctrination of party members as well as their participation in political-indoctrination work. This is a demand of the times. Political agencies must boost the scientific level of direction of party organizations and increase their aggressiveness and militance in the campaign against lack of imagination and empty ostentation in ideological work and the effort to achieve tangible results.

We are fully confident that military councils, commanders at all levels, Air Forces political agencies, party, trade union and Komsomol organizations, strictly guided by the decisions of the June (1983) CPSU Central Committee Plenum, will give some thought to a significant expansion of the range of all ideological, mass-political work and extending its influence to all domains of military life and affairs, particularly on increasing combat readiness and strengthening discipline and organization in Air Forces units and subunits.

3024
CSO: 9144/0035

GREATER MEANINGFULNESS OF PARTY DECISIONS SOUGHT

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9, Sep 83 (signed to press 1 Aug 83) pp 8-9

[Article, published under the heading "Implementing the Decisions of the 26th CPSU Congress," by Maj Gen Avn P. Dragovoz: "Authority of the Party Decision"]

[Text] Party organizations of aviation units and subunits, constituting the political nucleus of military collectives, delve deeply into all aspects of the daily life and activities of personnel, and work together with commanders and political workers to mobilize aviation personnel for exemplary performance of military duty. As was stressed at the All-Union Scientific-Practical Conference held by the CPSU Central Committee in Tbilisi, improvement of the activities of primary party organizations and increasing their fighting efficiency and authority is one of the key tasks at the present stage of our party's development.

Practical experience indicates that the most appreciable results are achieved by those units in which party members persistently implement the guidelines of the 26th CPSU Congress, the decisions of the June (1983) CPSU Central Committee Plenum, and the instructions of CPSU Central Committee General Secretary Comrade Yu. V. Andropov, chairman of the Presidium of the USSR Supreme Soviet, on development of initiative, activeness and high-mindedness and on improving all organizational-party and ideological-indoctrination work.

The party meeting is the highest agency of the party organization, spokesman of the collective will and thinking of party members, a school of indoctrination. At the party meeting Communists become ideologically toughened, learn to approach things in a party-minded manner, correctly to evaluate various phenomena and to make the right decisions, and learn to be firm and implacable toward deficiencies, arrogance and complacency.

Unfortunately it still happens that very general items are brought up for discussion by party members, and this makes it more difficult to analyze the activities of the party organization and individual Communists and leads to similar general, purely declarational decisions. Some party organizations narrow the range of problems discussed and repeat the same agenda month after month.

Work is handled differently by the party committee of the unit headed by officer M. Khanyukov. On each occasion considerable attention is devoted to determining the agenda of a party meeting or party committee session. At these meetings Communists discuss the tasks proceeding from the decisions of the 26th CPSU Congress and party Central Committee plenums, orders and directives issued by the USSR minister of defense, Main Political Directorate of the Soviet Army and Navy, commander in chief of the Air Forces, as well as from the need continuously to improve the quality of combat and political training, flight operations, and personnel indoctrination. Recently matters pertaining to intraparty affairs, observance by party members of the requirements of the CPSU Rules, party member ideological conditioning, ensuring a vanguard role in training and discipline, and increasing responsibility for the state of affairs in the party organization and guidance of Komsomol have been raised with increasing frequency at party meetings.

The party committee focuses principal attention on ensuring a vanguard role by party members in combat training, flight operations, and indoctrination of personnel in a spirit of discipline and organization. The question of the personal contribution by each party full member and probationary member to implementation of the decisions of the 26th CPSU Congress has become a topic of discussion at subunit party meetings. This agenda is of current relevancy and therefore evokes a lively response. Critically incisive, content-filled reports, carefully prepared with the assistance of the party committee, predetermine the lively, meaningful debate and the level of criticism and self-criticism. They evoke a lively exchange of opinions and motivate party members to express their attitude toward the topic under discussion and to make suggestions. This determines the result. Decisions are distinguished by precise determination of goals and tasks and the ways to accomplish them. Each point is carefully thought through and presented in a specific manner. It is precisely specified what is to be accomplished on what timetable and who is responsible. Such a decision makes it easier to organize and verify execution of planned measures.

The members of the unit party committee display an example of a responsible approach to carrying out adopted decisions. They seek to ensure that party committee decisions serve as a practical organizing element in their work. At seminars of secretaries of party organizations and party group organizers, the party committee systematically analyzes the state of affairs regarding intraparty work, the quality and status of implementation of party decisions. It seeks to ensure that a decree always clearly indicates what party members are trying to achieve and how they intend to achieve it. They hold the correct view that a decree or decision consisting of general points and appeals to "deepen," "intensify," and "develop" is not only useless but harmful as well, since it can give rise in some party members to an incorrect attitude toward party decisions as empty formalism. A focus precisely on deeds, not on high-flown words is a behest of the times, a demand of the party Central Committee.

At one meeting the party committee discussed measures to strengthen party influence on high-quality performance of tactical air exercise tasks by aircrews and engineer-technician personnel. The meeting was preceded by detailed preparations. Party committee members thoroughly examined the content of the

tasks which were to be accomplished during the exercise. The unit commander presented a report. Active participation by all party committee members in discussing the report and a meaningful, constructive approach to the question made it possible to add a great deal to the proposals which had been formulated in advance. The party committee decision proved to be quite specific. Each party member knew what he was to do, where and when. Officers B. Belokon', V. Kolpakov, and V. Ovchinnikov and squadron commanders officers A. Morgatov and Yu. Bozh'yev worked persistently toward this end. The party bureaus of the squadrons and their secretaries, officers V. Astashenkov and V. Razvalyayev, performed specific tasks.

As a result of the coordinated work, the party committee decision was fully implemented. The party organization made its contribution toward accomplishing the missions of the tactical air exercise. Aircrews performed with confidence in a situation approximating actual combat. The crew of party member officer V. Toropov, for example, distinguished itself during the exercise. The party organization promptly synthesized and publicized its accomplishment. There are other examples as well which attest to strongly active efforts by party members in carrying out adopted decisions.

The party committee led by Maj M. Khanyukov teaches Communists not only initiative and aggressiveness in formulating and making decisions, but also a high degree of responsibility for their unswerving implementation. Well-organized verification assists this to a great degree. At every party meeting the secretary mandatorily informs party members on how the previously specified plan is being fulfilled. There is strict observance of the CPSU Central Committee instruction that a new decision should not be adopted if the preceding one has not been carried out. The party committee monitors implementation of all meaningful suggestions presented by party members at a meeting. This practice helps develop in party members a feeling of involvement in the work being done by their party organization. All this unquestionably has a positive effect on accomplishing combat and political training plans and socialist pledges.

The mainline directional thrust in the activities of party organizations of Air Forces units and subunits is persistent, aggressive dissemination of the proceedings and decisions of the 26th CPSU Congress and subsequent CPSU Central Committee plenums. All party-organizational and ideological-indoctrination work is presently directed toward this. Many collectives have held party meetings with the following agenda: "On the personal contribution by party members toward implementing the decisions of the 26th CPSU Congress." Main emphasis was placed on securing a contribution by each and every party member toward improving air proficiency, skilled mastery of combat aircraft and weapons, improvement in tactical proficiency, instilling in all aviation personnel excellent moral-political and psychological qualities, and strengthening of order and military discipline.

Party members studied with a great deal of interest the speech by CPSU Central Committee General Secretary Comrade Yu. V. Andropov at the June (1983) CPSU Central Committee Plenum. The plenum proceedings were discussed in a lively manner in all units. Meaningful plans to implement the plenum decisions were formulated and adopted everywhere.

A focal position in the work being done by the party organization led by officer V. Sporyshev is currently occupied by instilling in Communists, especially leader personnel, a strong sense of responsibility for the assigned task and development in party members of initiative, innovativeness, and concern about the end result of labor.

The party committee endeavors to increase the effectiveness of its work and is eliminating formalism in ideological-political indoctrination of aviation personnel. It is especially concerned with the vanguard role of Communists in the campaign for increasing combat readiness and vigilance.

Or take another example. In the unit in which Maj V. Furtsev serves as party committee secretary, a number of preconditions for air mishaps occurred through the fault of young flight personnel. Party members -- headquarters and squadron leader personnel -- were then summoned to an enlarged meeting of the party committee. The agenda dealt with improving the work style and methods of the party committee and party bureaus in regard to increasing the responsibility of flight personnel for ensuring flight operations safety. A report was presented by party committee member deputy regimental commander Lt Col M. Khalizov. Party activists, including at the squadron echelon, took part in drafting a resolution. It was distinguished by concreteness and a businesslike character. It was decided to instruct party committee members Lt Col M. Khalizov and regimental senior navigator Lt Col V. Zhdanov, for example, to do additional work in connection with flight instructor training conferences on training young aircraft commanders. A report was to be presented by party member-leader Maj V. Popov on training young aircraft commanders. Party committee member Lt Col A. Volin was instructed to analyze the activities of aviation engineer service party organizations on extending the military-technical knowledge of aviation personnel, and party committee member pilot-expert marksman Lt Col M. Nekrasov was instructed to discuss with young pilots an article entitled "Strictly Obey Flight Rules and Regulations," which had been published in a military newspaper. The meeting resolution specified an exchange of experience and know-how by the top specialists, such as pilot and expert marksman Lt Col V. Seryy, who has logged more than 4,000 flying hours.

The results of the tactical air exercise attested to the increased air proficiency of flight personnel. The young officers did not make a single mistake which could lead to an air mishap.

Aviation personnel endeavor to utilize each and every minute, each and every hour of training time to improve combat and political training and seek fully to carry out adopted socialist pledges. The Communists of this and many other party organizations live in this manner.

The 26th CPSU Congress drew attention to the fact that some party committees spend a great deal of time on preparing for meetings and drafting resolutions and much less time on carrying them out. Such instances were noted in the party committees and party bureaus in which officers V. Chelnokov, A. Gorbunov, and I. Verba serve. Obviously party committee and party bureau members should periodically verify execution of decisions, report on decision implementation and meetings, and call to account those party members who fail to display

adequate persistence. In the final analysis this will draw attention to the obligation of implementing a party decision and will enhance its authority.

Party organizations of Air Forces units and subunits employ a special approach to preparation for report-election party meetings and party conferences. And this is natural, for they sum up performance results for a longer period of time and formulate decisions for a more extended time into the future. Party organizations are presently preparing for this year's report-election campaign. It is important to analyze in detail how previously-adopted decisions are being implemented and to determine whether all suggestions and comments by party members have been acted upon. Communists should be informed about this. But the most important thing is thoroughly to prepare for this year's reports and elections and to formulate specific decisions in order to achieve a further improvement in the level of all party work and to increase the influence of party organizations on all aspects of personnel daily life and activities.

Speaking of the nature of party decisions, we must also emphasize the following thought, which was stated at the June (1983) CPSU Central Committee Plenum: the party organization is called upon to carry out various measures by means of the forms and methods inherent in the party organization, without interfering in the supervisor's functions or taking his place. Unfortunately decisions reached at party meetings, party committee and party bureau meetings are sometimes like orders and instructions issued by command authorities. This practice must be dropped.

Effectiveness of party influence and authority of party decisions are directly dependent on how political agencies lead party organizations and how deputy commanders for political affairs organize party-political work together with party committees and party bureaus. Meriting approval is the practice where political agencies present for discussion at party activist seminars matters connected with organizing preparation for and conduct of party meetings, formulation of decisions, and verification of their execution. Communists should be focused on an uncompromising campaign against irresponsibility, deliberate deception, violations of various kinds, and slackness -- against everything which impedes forward movement. Work with people, concern about man, his needs and aspirations is a paramount task of party organizations.

Improving the quality of party work and increasing the practicality of party decisions and their unswerving implementation guarantee successful implementation of the guidelines of the 26th CPSU Congress, the November (1982) and June (1983) CPSU Central Committee plenums, and constitute a guarantee of additional success in increasing the combat readiness of Air Forces units and subunits.

3024
CSO: 9144/0035

"FALSIFIERS OF HISTORY" TAKEN TO TASK

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9, Sep 83 (signed to press 1 Aug 83) pp 10-11

[Article, published under the heading "On the Fronts of the Ideological Struggle," by Doctor of Historical Sciences Professor Col (Ret) V. Sekistov, honored worker in science and technology RSFSR: "The Truth of History and False Myths"]

[Text] The class struggle in the world arena is being waged in all domains of societal affairs and, as was emphasized at the June (1983) CPSU Central Committee Plenum, it is being fought with particular acuteness in ideology. The ideological struggle encompasses the history of the Soviet Armed Forces.

Bourgeois falsifiers have stepped up their activities in connection with the 40th anniversary of the decisive victories of the Soviet Army on the battlefronts of the Great Patriotic War. Falsifying the history of the USSR Armed Forces, they attempt to claim that all the victories of the Soviet Army in the war against fascist Germany were mere chance and had nothing to do with the art of warfare and heroism of the Soviet officers and men. In their opinion these victories are the result of miscalculations by Hitler, as well as U.S. and British aid to the Soviet Union, the influence of geographic conditions and weather, etc.

Right now, for example, the efforts of the falsifiers are directed toward distorting the historical truth about the events in the summer and fall of 1943 on the Soviet-German front. It was precisely during this time that the Wehrmacht's finest infantry, panzer, and motorized divisions as well as air units were thrown into an offensive which, as the fascist strategists figured, should lead to the crushing defeat of large Soviet Army forces and turn the war in favor of Hitlerite Germany. The invader miscalculated, however. Our troops inflicted a devastating defeat on the enemy, held the strategic initiative, and drove the occupation forces westward.

The victories of the Soviet Army at Kursk, and subsequently on the Dnieper exerted enormous and comprehensive influence on the entire course of the war and on the situation in the enemy camp. The result was completion of a radical turning point in World War II in favor of the antifascist coalition. This fact was acknowledged both by our allies and our adversaries. In August 1943, for example, U.S. President F. Roosevelt wrote in a communication to Moscow that

in the course of a month of immense battles the USSR Armed Forces, through their skill, courage, selflessness, and tenacity, not only had halted the long-contemplated German offensive but had also launched a successful counteroffensive, which was having far-reaching consequences. Senator L. Johnson, later U.S. President, called the defeat of the German-fascist forces during that period "a decisive setback for Germany."

Such an assessment by the leaders of the nations allied with the USSR in the struggle against a common foe is perhaps natural. But the admissions of the enemy himself are even more significant. Hitlerite generals Guderian, Manstein, Jodl, and others, acknowledging defeat in Operation "Citadel," considered the situation occurring as a result of this to be grave indeed for fascist Germany.

This is the historical truth. Imperialist, anti-Soviet circles in the West, however, attempting to distort the facts, are creating lying myths with the aim of besmirching the bright image of the victorious Soviet fighting man, for the purpose of disparaging the world-historic significance of the victory of the USSR, and in the final analysis justifying their own governments' policy of an arms race and preparations for another world war.

Literature on the Battle of Kursk has appeared in the United States and other NATO countries. The historic events are presented in this literature in such a manner as to suggest to the reader that the victories of the Soviet Army in the summer and fall of 1943 were merely fortuitous. American historian M. Caidin, for example, author of a monograph entitled "Tigers Are Burning," claims that the Battle of Kursk "could have ended differently." This claim was given support in March 1983 by the U.S. publication AIR FORCE MAGAZINE, which assured its readers that a concurrence of favorable circumstances had helped the Russians.

The ideological henchmen of the Reagan "crusade" against communism are now claiming that the Soviet Army allegedly enjoyed a superiority in numerical strength in the principal operations, a superiority which became possible after Anglo-American forces commenced combat operations in the Mediterranean and other theaters. Incidentally, such bourgeois falsifiers as British historian M. Howard (in the book "The Grand Strategy") claim that all the Soviet Army's victories were due to "numerical superiority" and adduce a certain historical pattern which allegedly shows the need to "catch up with the Russians," which the Reagan Administration is presently using to justify an unchecked arms race.

Bourgeois authors, however, ignore the fact that in certain sectors on the Kursk Salient the Hitlerite command authorities established a certain numerical superiority over the Soviet forces defending in those sectors. On the main axis of advance on the northern face of the salient, for example, the enemy had a 20 percent superiority to our forces in men and was equal in tanks. Consequently it was only due to unprecedented courage and staunchness on the part of the Soviet soldiers and the consummate military skill of the Soviet officers and general officers that the juggernaut of advancing fascist forces was halted and dealt a crushing defeat.

As for the influence of events in Italy, where Anglo-American expeditionary forces were mounting an offensive at that time, an additional 28 divisions and 5 brigades were sent to the Soviet-German front from the Wehrmacht reserve between September 1943 and January 1944, while 17 divisions and 1 brigade were holding the Anglo-American forces.

One of the devices employed by bourgeois falsifiers of history is the claim that in Operation "Citadel" the Hitlerite command authorities were pursuing "comparatively limited objectives." But once again the facts indicate something else altogether: a total of more than 100 Wehrmacht divisions (42 percent of all fascist divisions operating on the Soviet-German front during that period) were involved in the Battle of Kursk. The enemy threw his main forces into the fray here: his finest panzer, motorized, and air combined units -- since the enemy's calculations of achieving a turning point in his favor not only here but in the war as a whole against the nations of the antifascist coalition counted on success in the forthcoming offensive. Are these "limited objectives"?

It is impossible to ignore that incontrovertible historical fact that the German-fascist army lost the Battle of Kursk and was unable to hold its ground on the Dnieper. While acknowledging this, however, some bourgeois authors work diligently to devise "scholarly" arguments to justify the aggressor's defeat. Who in their opinion is to blame? Hitler is to blame, they claim, since he, they say, personally made the decisions, while all the Wehrmacht generals were merely "executors of his wishes." Their reasoning is simple: the Fuehrer of the Third Reich is dead, it is an easy matter to blame everything on him, while the Hitlerite generals and the war machine of Germany's monopoly capital still exist -- they must be whitewashed, and their position within the aggressive NATO bloc must be bolstered.

Falsification by bourgeois historians of the significance of the Battle of Kursk is also manifested in other forms. One of these is a description of this battle as merely a tank battle. It is true that tank troops were employed in mass numbers on both sides. Soviet armor proved to be stronger, and the Soviet tankers proved to be more skilled, braver, and more resolute. At the same time, however, fact remains fact: the victory at Kursk was won by the combined efforts of infantrymen, artillerymen, tankers, and pilots. Not only enemy Tigers were burning at that time, but also hundreds of Junkers, Heinkels, Messerschmitts, and Focke-Wulfs were being downed. Wehrmacht casualties and losses in this battle were as follows: approximately 500,000 officers and men, 1,500 tanks, 3,000 guns, and more than 3,700 aircraft. Thirty enemy divisions were defeated in detail.

Bourgeois falsifiers have not simply "forgotten" the Soviet Army's victory. They are attempting to depreciate its significance, claiming that in the summer and fall of 1943 fascist Germany's leaders were employing the bulk of their combat air forces against U.S. and British forces to protect the Wehrmacht's rear areas and to provide cover for combat operations in the Mediterranean Theater. But one can deceive only those readers who are unacquainted with the statistics of the last war. Simple arithmetic exposes the falsifiers. At that time, for example, the bulk of fascist air power (approximately 55 percent of the Luftwaffe's aircraft) was operating on the Soviet-German front.

Some bourgeois historians have gone so far as to disparage Soviet aircraft, utilizing all kinds of falsification devices. A number of U.S. illustrated publications on the history of World War II, for example, contain photographs of the last war's finest weapons and combat equipment. The reader will find dozens of U.S., British, German, and Japanese aircraft.... The only Soviet aircraft named is the Il-2. One might ask: just what weapons destroyed all those thousands of swastika-bearing aircraft which appeared in Soviet skies during the war? It has been established that the Hitlerites lost the greater part and the cream of the Luftwaffe on the Soviet-German front.

Soviet air forces gained air superiority over the Kuban in the spring of 1943 and over the Dnieper in the summer of 1943, and in the Battle of Kursk, superiority which Soviet air power firmly held right up to war's end. The U.S. military newspaper STARS AND STRIPES stated at the time, impressed by this fact: "The Russians have the skies locked up." Bourgeois historians have buried this acknowledgment in oblivion.

Time inexorably marches on. The events of the Great Patriotic War recede ever further into the past. The echo of past battles, however, continues to resound today on the fronts of the unabating ideological struggle between the forces of socialism, peace, and progress on the one hand and the forces of capitalism, war, and reaction on the other. Recently the myth of a "Soviet military threat," which is in style in the West, was joined by a new phony claim, concocted across the Atlantic on the basis of falsification of the history of World War II. Bourgeois authors (U.S. Sovietologist S. Kaplan, for example) have begun to claim that, having fully accomplished in 1943 a radical turning point in the war, the Soviet Union allegedly proceeded to carry out... "expansion." Fabrications about Soviet "expansionism" are not new. A great many variations have been concocted by bourgeois ideologists on this subject at various times. The new element today lies in the fact that in the West they have specified a "point in history" from which this mythical "expansion" commenced -- the end of 1943. "Hawkish" historians categorize under "expansion" all Soviet Army operations conducted in the latter half of 1944 and in 1945 for the purpose of liberating the countries of Europe and Asia which were occupied by the fascist-militarist bloc.

Washington's myth of "Soviet expansionism" is closely linked with a fiction to the effect that the Soviet Union is also attempting today to break the achieved military-strategic parity between the USSR and the United States, to gain military superiority and virtually to dictate its own will to the West with the aid of arms. The absurdity of these and other lies was fully exposed at the June (1983) CPSU Central Committee Plenum.

The history of the failures of military campaigns by international imperialism against the USSR should have taught a great deal to those who today are brandishing a nuclear truncheon. The Soviet people cannot be intimidated. They defended the socialist homeland against the threat of fascist enslavement during the years of the Great Patriotic War and are today keeping a vigilant eye on the intrigues of the enemies of peace and are stinting neither resources nor energy to strengthen the defense capability of the USSR and the nations of the socialist community.

3024
CSO: 9144/0035

CRITICAL ROLE OF FLIGHT INSTRUCTORS NOTED

Moscow AVIATSIA I KOSMONAVTIKA in Russian No 9, Sep 83 (signed to press 1 Aug 83) pp 12-13

[Article, published under the heading "Marching in the Vanguard," by Capt O. Podryadchikov: "'Everything Depends on You....'"]

[Text] Maj V. Shcherban', appointed to the position of squadron deputy commander for political affairs, quickly established himself in his new job. The people in the political section at Borisoglebsk Higher Military Pilot Aviation School imeni V. P. Chkalov had heard a great many good things about this officer: that he was a highly-skilled pilot instructor, a knowledgeable political worker, skillfully assisted the subunit commander in leading the collective, and successfully encouraged aviation personnel to accomplish more in combat training.

Major Shcherban' has served at the school for 8 years. He has taught many cadets to fly. Valeriy Stanislavovich regularly increases his professional knowledgeability, constantly analyzes successes and mistakes, and generously shares his experience and know-how with subordinates. When the subject of discussion is student personnel, he always draws one's attention to how important it is to know people's individual qualities. This officer-indoctrinator does not divide trainees into difficult and easy categories. If a student is falling behind, for example, in flight or theoretical training, he endeavors to organize work in such a manner as to help him catch up as quickly as possible. But the more capable students also need assistance.

Last year third-year students were assigned to Major Shcherban's flight. They had successfully completed the training curriculum on the L-29 basic trainer, and now they would be learning to fly more complex equipment. The flight commander studied their files. It was noted in the service record of cadet O. Protsenko, for example, that he possessed good knowledge of theory and had an inquisitive nature. He had no doubt as to the objectivity of the report. Protsenko indeed was enthusiastic about study, was hard-working and diligent. He was among the first to solo. He flew intelligently and with confidence. This boded well for the future.

Some time passed. Analyzing Protsenko's flight training performance and comparing it with the initial period of training, Major Shcherban' concluded that

the officer candidate, evidently pleased with his initial success, had become complacent and was devoting less attention toward improving his knowledge and skills. Grades of 5 began to be replaced by fours in his logbook. Probably that ease with which the student pilot had assimilated everything which the instructor taught him had lessened his desire to improve to a new level in professional expertise.

Major Shcherban' thought about it. Protsenko could do a better job of flying. Evidently he lacked persistence and purposefulness. He had failed to develop a sense of dissatisfaction with achieved results.

The flight commander decided to increase demandingness on the officer candidate. His plan was simple: pride would not permit Protsenko to lose his reputation as a good student.

The flight commander's demandingness proved effective. Protsenko began to study harder and frequently asked the officer to give him additional practice sessions, drills, and individual consultation. Major Shcherban' patiently explained those things which he could not grasp and taught him what should be done and how.

All this produced good results. Protsenko is now completing school. He has received excellent marks. He is highly respected by his comrades. Oleg takes active part in volunteer work -- preparing visual propaganda materials, putting out a photo newspaper, and defends the subunit's honor in soccer competitions. Protsenko's term of probationary membership is coming to an end: soon he will become a full member of the Communist Party.

A great deal of work had to be done with officer candidate Pilipenko. He had a poor grasp of theory and was rather lazy. He was unable to relax at the controls of an aircraft, and for this reason he frequently made mistakes. On one occasion he was close to causing an accident. Some of the instructors felt that it was inadvisable for Pilipenko to continue in the training program. In flying it sometimes happens that failure becomes chronic. And regardless of efforts by superiors, the student pilot is not always able to correct his errors. They say that such individuals were not meant to fly.

Major Shcherban' took his time reaching a decision. He thoroughly analyzed Pilipenko's experience while assigned to that flight and reached the conclusion that most of the mistakes he had made in the air were a reflection, as it were, of his conduct on the ground. This officer candidate frequently committed breaches of military discipline. "Of course Pilipenko is not focused fully on flying," Shcherban' reasoned. "He is impeded by his own lack of organization and lack of self-control. Perhaps this is what we should address. The main thing is to develop in him a sense of responsibility, to teach him discipline, to teach him persistence in working toward the stated goal." Once when he was conversing with Pilipenko, the flight commander asked him straight out: "Do you want to fly?"

"Yes...."

"If you do," the major stated with some harshness, "you must first learn to observe military discipline. It will require a great deal of work; everything depends on you. I will do everything I can to help."

Major Shcherban' began at the most elementary level. He drilled the cadet on the fundamentals of theory of flight and flying. He proceeded from the simple to the complex, explaining the procedures of takeoff, gliding, and landing. He made Pilipenko commit emergency procedures to memory. This was followed by intensive practice in the cockpit.

Once the flight commander noticed that Pilipenko had come to a preflight session with a soiled collar lining. He rebuked him.

"Next time," the officer warned, "Don't come to class like that."

Of course changes for the better did not occur immediately in this officer candidate's conduct. On one occasion Pilipenko had done a poor job of preparing for a flight session and displayed poor knowledge when tested for readiness. The flight commander punished him. Nevertheless the cadet was making significant advances in the flight training program. Each time up he made fewer mistakes.

Some time later Pilipenko took a check ride with the regimental commander and received a mark of good. This was a victory in the effort to salvage a student pilot. And credit for this was deserved by Major Shcherban'. He helped the officer candidate gain faith in his own ability and develop firmness of character.

Purposefulness, persistence, and high-mindedness are very important qualities of a pilot-instructor. We should state that when Valeriy Shcherban', upon completing school, was assigned to an aviation training regiment, he was unhappy. He wanted to fly the most modern equipment. He even submitted a request through the normal chain of command to be reassigned to a line unit. His request was turned down, however. And this turned out for the best, according to Shcherban'. When he plunged into his instructor's job, he realized that this was his calling.

"Instructor is an innovative job," says Major Shcherban'. "It is inconceivable without thorough knowledge of people and the ability to establish communication with one's subordinates. It impels one to work tirelessly to improve one's teaching and professional skills, and of course forces one to think, to seek the most efficient ways and means of influencing trainees. In short, the work is interesting. And if one considers the importance attached by the party to indoctrination of youth and man's moral and ethical improvement, to forming in people an active attitude toward life and a Communist attitude toward one's assigned task, it will become clear that the profession of instructor is taking on considerable importance to the state."

Major Shcherban' was designated squadron deputy commander for political affairs. He was aware of the great trust which was being placed in him. And he set about his new, responsible task with redoubled energy. How many additional concerns rested on this officer's shoulders! The main concern was to establish

communication with people, to help the commander get them to perform exemplary military labor. The fact is that a businesslike microclimate and highly moral atmosphere had long since formed in the collective. The subunit's personnel were distinguished by cohesiveness, organization, and discipline. The deputy commander for political affairs decided to do everything he could to support and encourage this atmosphere, displaying right-mindedness and demandingness.

The political worker and the squadron commander, Major Kovalev, once analyzed the state of affairs in one of the flights. Disciplinary infractions had recently become more frequent in occurrence. Flight commander Major Dobrokhotov had been devoting insufficient attention to his pilot-instructors and had failed to concern himself with developing in them such commander qualities as demandingness and the ability correctly to utilize their disciplinary powers. Measures had to be taken.

The members of the party bureau summoned the flight commander to a meeting, pointed out deficiencies to him, and gave recommendations on how to correct them. Thanks to the efforts of these Communists, Major Dobrokhotov succeeded in correcting the situation. His flight was one of the squadron leaders in results of socialist competition for the winter period of training.

...Early one morning Major Shcherban' was on his way to the airfield. He was overtaken by a formation of cadets. Valeriy Stanislavovich spotted among them his own former students, former third-yearmen. They had grown and matured in the last year. Graduation will take place this fall. New young officers, including his pupils, will join the ranks of winged defenders. This thought made him quite pleased.

3024
CSO: 9144/0035

IMPORTANCE OF BREAKING IN NEWLY-COMMISSIONED OFFICERS DISCUSSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9, Sep 83 (signed to press 1 Aug 83) pp 14-16

[Article, published under the heading "Implementing the Decisions of the 26th CPSU Congress," by Honored Military Pilot USSR Lt Gen Avn L. Klochikhin, chief of the Air Forces Personnel Directorate: "The Regiment Greets Lieutenants"]

[Text] It seems just yesterday. Several of us young pilots, wearing spanking new uniforms, reported to our duty assignment in the Far East after completing school. We had been assigned to an island airfield. Decades have passed since that time. Naturally a great many things have been forgotten. But there are events which I doubt if I will ever forget. One of these is my first encounter with my regimental commander. He was a combat veteran of the Great Patriotic War, pilot 1st class Col A. Chertkov, who had twice been awarded the Order of the Red Banner, plus the Order of the Patriotic War, 1st class, as well as other medals and decorations. He subsequently graduated from the General Staff Academy imeni K. Ye. Voroshilov and held a number of important positions in the Air Force. Major General Aviation Chertkov is now retired.

At the time there were many combat veterans in the regiment. On national holidays and other festive occasions they would appear in their dress uniforms, bristling with combat decorations, which better than any words told about the military deeds of these brave people, about their services to the homeland during a time of most difficult ordeals for our nation. We young pilots gazed with admiration at experienced air warrior Hero of the Soviet Union A. Konstantinov (presently colonel general aviation, honored military pilot USSR) as well as masters of swift attack squadron commander Maj M. Starokozhev, flight commander Capt Z. Aksyutin, and others. From them we learned boldness and determination, assiduously adopted their advanced know-how, and listened closely to their advice and instructions.

My first regiment and the comrades with whom I began my service career upon graduating from military aviation school have remained permanently in my heart. I shall never forget that it was here where I gained my combat wings, learned the value of genuine military friendship, and assimilated military precepts.

I particularly remember my regimental commander. From him we had learned faithfulness to military duty, dedication to our chosen profession, discipline, and conscientiousness in all things. For us lieutenants he was a commander with a capital C. Colonel Chertkov taught us through personal example -- by conduct, honesty, high party-principledness, and excellent flying skill. His words never differed from his deeds. For this reason none of us could even conceive of letting him down, failing him, committing a breach of military regulations. The young officers emulated their commanding officer.

Words from the regimental commander usually began with a statement about the unit's traditions, the missions it was performing, the specific features of military service, the place and role of each young officer in maintaining a high level of vigilance and combat readiness. But it is not only a matter of what to say; how to say it is of importance. Young officers like it when you talk to them with inner enthusiasm and emotional coloration. You experience events together with them, and in your mind's eye you see yourself as you were whe you reported to your first duty assignment -- young and filled with hopes. The acuteness of the commander's thoughts and feelings, his endeavor to talk to all his men and at the same time with each one individually, as it were (and this is precisely how young officers perceive his words) create that invisible but clearly tangible spiritual contact between him and his men. Such get-togethers and earnest conversations leave a deep imprint in the lieutenants' consciousness, making a strong impression on them. A commander's acquaintance with his young officers begins essentially with this; mutual relations are established, which in large measure will also determine the young officers' development into combat-ready pilots.

And at a later time, when the lieutenants are asked what were the most memorable events for them, they will surely name both the first contact with their commanding officer and their first solo flight. They will remember the frank and very useful talk their commanding officer had with them on the honor and dignity of the Soviet officer, on his ethics and morality, on his role in unifying a military collective, on maintaining a healthy microclimate in it, and they will remember his fatherly advice, his admonition to continue in a worthy manner the great cause of their fathers and grandfathers -- to strengthen with persistent military labor the combat might of our heroic Armed Forces, which are vigilantly guarding the security of the Soviet homeland and its friends.

A certain amount of experience in working with service school graduates has been amassed in Air Forces units and combined units. Commanders, political agencies, headquarters staffs, party and Komsomol organizations prepare in advance to greet them: they allocate well-equipped buildings for officer dormitories and apartments, and they prepare a special training program, taking into account the occupational specialty acquired at service school. Those officers who are the best methods specialists are assigned to conduct training classes, and an experienced officer-mentor is assigned to each lieutenant. The political workers give thought to how the lieutenants should be enlisted into active participation in regimental volunteer activities, so that each individual can fully reveal his abilities, become conditioned on specific activities and learn to prize the honor of the military collective.

These efforts are well organized in the helicopter regiment which until recently was under the command of military pilot and expert marksman Hero of the Soviet Union Col V. Pavlov. Vitaliy Yegorovich is not only a skilled and courageous air warrior but also a wise commander-educator and able indoctrinator. He is demanding and strict. He devotes a great deal of time and effort to improving his own proficiency level. He offers an example to the young aviators by his flawless efficiency, his rigorous observance of flight operations rules and regulations, and by his high degree of flying, weapon, and tactical proficiency.

This vanguard commander is sincerely pleased when he sees how the young pilots with whom he has worked gain experience and maturity on unfamiliar and difficult mission routings, and he is pleased to see the persistence with which they amass experience and master combat skills. There is plenty they can learn from these top-rate air warriors!

Helicopter pilots are called upon to perform the most diversified tasks in the course of military training. They remember, for example, an exercise at which they were working in coordination with motorized riflemen. The helicopter crews were to fly an airborne assault force to an important installation, to which the "aggressor" attached particular importance. The helicopters arrived in the designated area precisely on schedule. Delivery of the assault force was accomplished smoothly. Soon the helicopters were in the air again.

But subsequently the situation deteriorated. The "adversary" commenced aggressive actions. The motorized riflemen would have had a hard time of it without helicopter fire support. The group leader ordered his men to return to the motorized riflemen's position. The helicopters arrived in time. They hit the "aggressor" with their entire firepower and thwarted his plans.

"One cannot count on chance success in today's difficult, rapidly changing combat situation. It is necessary to act boldly, decisively, and innovatively in the air. And, most important, one must think, look for new tactical devices," Colonel Pavlov reminded his men during a postmission critique.

He seeks to ensure that the young officer-helicopter pilots comprehend that there are no easy roads in the skies, that success in today's highly-dynamic combat, with employment of diversified military hardware, is produced by solid knowledge and great skill, courage and initiative, decisive actions and keenness of wit.

An important role in instilling in young aviators a feeling of pride in their regiment and their profession is also played by skilled propaganda of glorious combat traditions and the successes of outstanding personnel. The following has become customary in a number of Air Forces units: newcomers begin their acquaintance with the regiment with a visit to the combat glory room. This moving ritual exerts a strong emotional and psychological effect on the lieutenants. As a rule they make their visit in dress uniform. Frequently they are greeted at the site of the visit by combat veterans, many of whom are wearing government decorations for deeds accomplished defending the socialist homeland. Sometimes documentary films taken by combat cameramen are shown, telling

of the courage and staunchness of the men of the regiment during the harsh years of the Great Patriotic War. Sometimes tape recordings are played in the combat glory room. The hushed aviators listen to the taped words of a war veteran. These simple, artless words, coming from the heart, leave a deep imprint in their consciousness. The museum displays recreate the atmosphere of those distant harsh and heroic years.

Initiative and innovative approach are important in disseminating the fine fighting aviator traditions. They are manifested in the loving care taken in setting up the museum or combat glory room, and in skilled utilization of displays and materials in indoctrinating the younger generation.

Many unique documents are preserved in the combat glory museum at a certain guards aviation unit. They tell of the heroic deeds of the crews of long-range bombers which fought against the fascist invaders. Each display, each rare photograph recording a combat incident is a priceless memento which strengthens the bond between the older generation of aviators and today's young fliers.

A lecture agency is operating in the unit. Experienced propagandists, highly-skilled specialists present lectures to the lieutenants on diverse topics, including topics dealing with education science and psychology.

At the regiment's combat glory museum a young officer once said to a comrade: "This is not a regiment but a real academy." Of course he meant that service [illegible] regiment had become an excellent school of life and indoctrination for the older-generation men of that guards regiment. It will be the same for the new young aviators. Traditions here, like a living, inextinguishable flame, serve as a reliable point of reference for those who are taking their place behind the regimental colors, in order to continue in a worthy manner the heroic deeds of the war veterans.

The development of a young officer, his activeness and persistence in performance of duty is always an untrodden path. Nobody is guaranteed against mistakes. But can this justify the fact that some young officers ignore the experience of their senior comrades, experience which has been put to the practical test of time? Why does this happen?

I believe that this is caused by the fact that, when indoctrinating young aviators, superior officers do not always consider the steadily increasing demands on officer cadres and their enormous role in maintaining a high level of Armed Forces combat readiness. It is important more thoroughly to assimilate the decisions of the 26th CPSU Congress, the conclusions and points proceeding from the decrees of the November (1982) and June (1983) CPSU Central Committee plenums, orders and directives by the USSR minister of defense, and strictly to be guided by them in practical activities. It is essential more fully to take into consideration the psychology of the young officer and the specific features of his growth as a person whose job is to command others and to work in coordination with them. The fact is that, busy with the daily routine, some commanders rather quickly fail to keep an eye on the recent service school graduate, and he begins gradually losing interest in his job and in training. For example, serious mistakes were revealed in the fighter-bomber squadron under the command of Maj V. Talov. He spends little time on training and

indoctrinating subordinates, and he devotes inadequate attention to the flight commanders and young officers. Seeing the lack of demandingness of their commanding officer, the pilots began breaking rules and violating discipline. In addition, there was also discovered failure to observe proper methods of preparing pilots for flight operations, which led to diminished quality of flight training.

We know that arrival of a young officer at a new duty assignment signifies the beginning of a qualitatively new stage in his military biography. A great deal is said about this newcomer. It is not always stressed, however, that this moment signifies first and foremost his entry into a complex system of interrelationships within the unit. A lieutenant enters into close contacts with subordinate personnel and at the same time with persons who are his equals and superiors in rank and position. Here too it is very important that superior officers have the ability to establish meaningful communication with a young lieutenant, get to know his individual qualities as thoroughly as possible, and determine those character traits which may negatively affect his development.

One must bear in mind that, in performing various job dut'es and interacting with his colleagues, an officer remains a unique individual, a person with inherent good and bad qualities, with his feelings and aspirations, needs and inclinations, with his ideas and plans. He likes some things and some people in the unit, while he dislikes other things and other individuals. His relations are also selective by virtue of this: he displays kindly feelings toward some, endeavoring to establish closer contact; with others, on the contrary, he is reserved, while he is indifferent toward still others. Of course a certain reserve toward a young officer on the part of other officers also indicates degree of liking and dislike. Sooner or later all this begins to affect professional relations and the character of communication with his colleagues. Everything works out fine if personal relations, superimposed on work relations, as it were, augment them in a positive sense.

Lt Tech Serv A. Aksenenko once reported for duty at a certain unit. While he was still an officer candidate at the Irkutsk Order of the Red Star Military Aviation-Technical School imeni 50th Anniversary of Komsomol, his capabilities as a future Aviation-Engineer Service specialist were revealed. He received for the most part top marks in all subjects. He performed all assignments conscientiously, thinking primarily of quality. In the course of intensive training and active volunteer work he developed both as a technician and as an educator. Aksenenko received the highest mark in the government examinations. He was accepted to CPSU membership while at school. This officer candidate distinguished himself with exemplary conduct and dedication to his chosen calling.

From his very first days in the squadron, the young officer proved to be a good organizer. He had a demanding attitude both toward himself and his comrades. If there was a problem, he did not hesitate to take counsel with the specialists 1st class and to obtain knowledgeable advice from them. In time the emblem "Unit Outstanding Aircraft" appeared on the fuselage of his missile-armed aircraft. The young officer successfully passed the examination for 2nd class.

Party member Aksenenko, as one of the best young specialists, was recommended for enrollment at the academy. He worked hard preparing for the examinations. But the unexpected happened: the medical board determined a slight worsening of his state of health.

Aksenenko did not give up. He continued just as conscientiously performing his duties and was always among the socialist competition right-flankers. Recently Gds Capt Tech Serv Aleksandr Aksenenko, on the recommendation of the unit command, was named technical maintenance unit servicing team chief. Within a short period of time the officer twice received an early rank promotion.

As we see, the professional growth of young officers depends in large measure on themselves, on their attitude toward performing their job duties, on their ideological-political conditioning and professional skills, on their experiential attitude, and on a demanding approach to evaluating their military labor. Obviously every new service school graduate should constantly keep this in mind. "The combat readiness of a unit or naval ship," noted USSR Minister of Defense MSU D. F. Ustinov in one of his speeches, "is formed of the combat readiness of subunits and individuals. For this reason each and every soldier, sailor, noncommissioned officer, petty officer, and officer should assess all his deeds and actions from the standpoint of their influence on the combat readiness of the subunit and unit.... Each serviceman should constantly ask himself how he has carried out his duty today, how he has lived up to the military oath, and whether he has done everything possible to increase combat readiness."

A large detachment of skilled and wise mentors of youth has been developed in Air Forces units and subunits. Gds Capt N. Nikishkin, for example, commander of an excellent-rated flight, enjoys an excellent reputation. He has successfully mastered the tactics of air combat in a modern fighter aircraft and is distinguished by flawless flying technique. This officer-Communist generously shares his knowledge and experience with his lieutenants and serves as an example for them in all things. It is not surprising that this flight has for an extended period of time maintained a leader position in competition and that its commander has been recommended for promotion to a new position.

The breaking in of lieutenants and their development are inseparably linked with the activities of the one-man commander -- a supervisor of training and indoctrination, an organizer of socialist competition, and a champion of strict observance of regulations. One can always feel the most direct and immediate link between how a commander performs his duties, how he conducts himself both on and off duty, and the successes of his subordinates in all domains of military life.

The vanguard commander is a model to be emulated. And lieuterants, stating it figuratively, tune to his frequency. Subordinates long remember the best commanders and political workers and emulate their example in their daily lives, on the job, and in civic affairs.

It was noted at the June (1983) CPSU Central Committee Plenum that the people rightly call our army and navy a school of courage, diligence and high morality.

We should continue in the future making every effort to enhance the indoctrinational role of the Soviet Armed Forces. The Plenum documents clearly point out ways to enrich the content of ideological-indoctrination work, its forms and methods. Therefore the program points and conclusions contained in Comrade Yu. V. Andropov's speech, which were unanimously approved by the CPSU Central Committee, should form the basis of activities of Air Forces commanders, staffs, and cadre agencies in teaching and indoctrinating young officers. Purposeful and effective work with lieutenants will help more rapidly break them in as winged defenders of the homeland and help them hold high the honor of an officer of our glorious Air Forces.

3024
CSO: 9144/0035

CREW OF SOYUZ T-9 INTRODUCED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9, Sep 83 (signed to press 1 Aug 83) p 17

[Article by S. Yegupov: "Crew of the Soyuz T-9"]

[Text] The manned spacecraft Soyuz T-9 was launched into orbit on 27 June 1983. On 28 June, after docking with the Salyut-7 station, its crew -- commander Col Vladimir Afanas'yevich Lyakhov and flight engineer Aleksandr Pavlovich Aleksandrov -- transferred on board the station and went to work.

The mission schedule for the crew of the scientific research complex is extensive, diversified, and strenuous. It specifies performance of experiments in the interest of further investigation and exploitation of space, development and improvement of manned space hardware, and performance of many tasks for the nation's economy.

The commander of the Salyut-7 - Soyuz T-9 - Kosmos-1443 orbiting scientific research complex, V. Lyakhov, is a military pilot 1st class and test pilot 3rd class. He was born in 1941 in the town of Antratsit, Voroshilovgrad Oblast, in a worker family. Graduating in 1964 from the Kharkov Higher Pilot Military Aviation School, he served in Air Forces units. He has been a member of the CPSU since 1963.

In 1967 Vladimir Lyakhov was assigned to the Cosmonaut Training Center imeni Yu. A. Gagarin. He began preparing for space missions in 1969. Between 25 February and 19 August 1979 he flew a 175-day mission on the Salyut-6 - Soyuz - Progress orbiting scientific-research complex, for successful accomplishment of which and for courage and heroism displayed on this mission he was awarded the title Hero of the Soviet Union.

Vladimir Lyakhov has worked hard to increase his knowledge of theory and specialized knowledge. In 1975 he graduated as a correspondence student from the Air Force Academy imeni Yu. A. Gagarin.

Flight engineer A. Aleksandrov was born in Moscow in 1943. In 1964, upon completing his tour of service in the Soviet Army, he took employment at a design office. He proved to be a knowledgeable engineer with initiative. In 1969 he completed studies at the evening faculty of the Moscow Higher Technical

School imeni Bauman. A. Aleksandrov has been a member of the CPSU since 1970.

Aleksandrov joined the cosmonaut corps in 1978. In June 1981 he was assigned to a group training for manned missions on the Soyuz T spacecraft and the Salyut orbiting station. He trained very conscientiously for the forthcoming mission.

At a traditional party meeting at the Cosmoanut Training Center imeni Yu. A. Gagarin, V. Lyakhov and A. Aleksandrov assured party members that they would apply all their energy, knowledge and experience in order successfully to accomplish the tasks of the forthcoming mission and stated that they were dedicating it to an important event in the life of the Communist Party and Soviet people -- the 80th anniversary of the Second Congress of the Russian Social Democratic Workers' Party.

3024
CSO: 9144/0035

SHARPENING PILOT SKILLS WITH INFORMATION LOOP ANALYSIS

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9, Sep 83 (signed to press 1 Aug 83) pp 18-19

[Article, published under the heading "Flight and Psychology," by military pilot - instructor 1st class Lt Col N. Litvinchuk and Capt Med Serv V. Kozlov: "What Is the Most Important Information?"]

[Text] Pilot cadet V. Vasil'yev was about to take a check flight into the practice area to execute advanced maneuvers. Having thoroughly prepared, the lad was confident that he would do a good job. Things worked out differently, however.

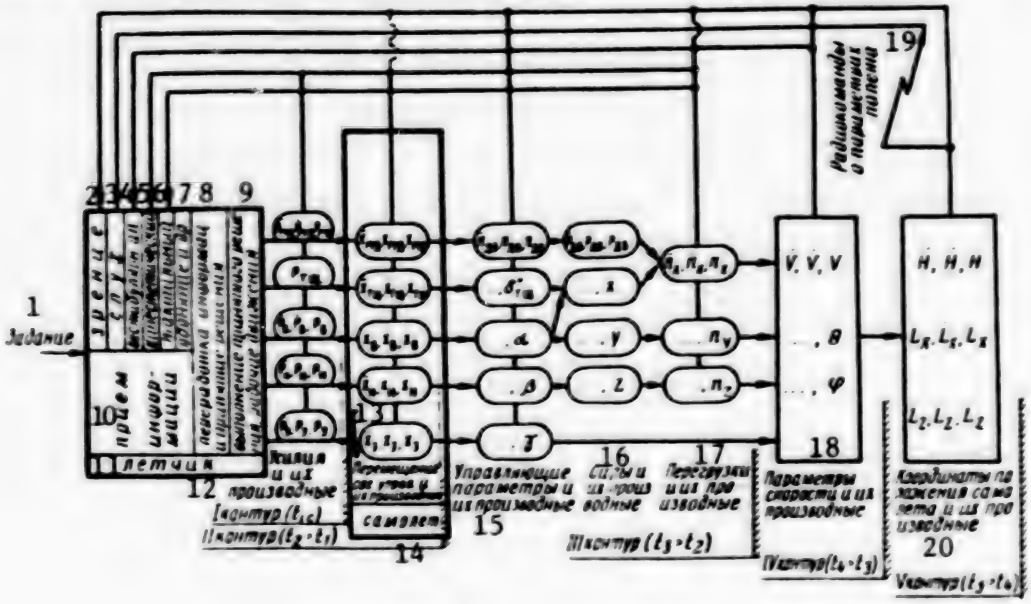
After the instructor demonstrated the sequence of maneuvers to the officer candidate, Vasil'yev proceeded to practice them. He immediately felt unsure of himself. Because things moved so swiftly, he was slow in switching his attention, was late in manipulating the controls, and during the first half of a loop and Immelmann turn, his eyes were literally glued to the forward hemisphere. The pilot cadet was waiting for the line of the horizon to appear. As a result he failed to monitor the aircraft's angular rotation and failed to notice that he was losing airspeed at the top of the maneuvers.

During the subsequent critique session the instructor determined that the young pilot had been using primarily visual information and had not been paying attention to other signals. The inability to utilize all types of information when mastering flying techniques is characteristic of many pilot cadets and young pilots. The primary reason is that insufficient attention is devoted in the flying methods literature and in the training process to evaluation and utilization of information during flight. But the structure of information evaluation is rather complex and significantly affects the forming of flying and orientation skills.

Information differs in its physical nature (visual, auditory, etc) and possesses different accuracy (instrument and non-instrument), spatial (obtained from where) and temporal (when it is obtained) characteristics. The latter are determined chiefly by the dynamics of change of flight parameters and operation of aircraft equipment and systems. This makes it possible to plot the space-time structure of information coming to the pilot (information diagram) and to show the dynamics of change in flight parameters while flying an aircraft. All information coming in

from different sources can be combined into five loops, on the basis of when it is perceived (see figure).

Dynamics of Change in Flight Parameters and Information Diagram



Key:

1. Problem
2. Vision
3. Hearing
4. Vestibular mechanism
5. Kinesthetic
6. Tactile
7. Olfactory, etc
8. Information processing and decision making
9. Execution of decision, working movements
10. Receipt of information
11. Pilot
12. Forces and their derivatives
13. Control displacements and their derivatives
14. Aircraft
15. Control parameters and their derivatives
16. Forces and their derivatives
17. Load factors and their derivatives
18. Speed parameters and their derivatives
19. Radio commands on flight parameters
20. Aircraft position coordinates and their derivatives

контур. loop

The first loop contains data on the magnitude and nature of change in force applied to the aircraft controls. This input infotmation comes through the motor (on muscle exertion) and tactile (pressure on the hand) analysors and enables one to check the magnitude of control force. Information delay time is the least in this loop, since force signals arrive practically instantaneously.

Information on rate, magnitude and other indicators of control displacement goes into the second loop. It also comes via the motor (on muscle contraction or relaxation) and tactile (pressure on the hand) analysors. It can also be obtained visually if one observes the movement of the extremities and displacements of engine controls, joystick and rudder pedals, but it is impractical to

do this. Signal delay time is greater in this loop than in the first one, and is determined by inertia and character of control (vigorous or languid).

The third loop contains information on change in individual parameters of flight and operation of aircraft systems. For example, signals on angles of aircraft turn (α, β, γ) relative to coupled coordinate axes, engine rpm, position of control surfaces, flaps, speed brakes, and the g-forces generated thereby. When the aircraft turns, the spatial position of references outside the cockpit also changes, and displacement of the line of the horizon occurs. G-forces, if their values exceed threshold, are perceived by the vestibular, motor, and tactile analysors, while increase in engine rpm is perceived on the basis of noise and vibration intensity and change in their frequency characteristics. The motor, tactile, vestibular, auditory, and visual analysors are involved here. In addition, instrument signals also appear in this loop. The magnitude of normal G-forces, engine rpm, angle of attack, angle of bank, slip, and position of control surfaces can be monitored visually on the basis of instrument readings and warning indicators. In this case information delay time depends on aircraft speed, controllability characteristics and engine response, and can be as much as 1-2 seconds.

The fourth loop contains information on change in magnitude and direction of the velocity vector and its derivatives. There occur thereby changes in pitch and yaw angles, which in turn include change in third loop parameters (α, β). An important role here is played by visual non-instrument signals on change in spatial attitude and angular velocity of displacement of exterior references (ground objects, clouds, sun, horizon line, etc). Certain information on speed is carried by aerodynamic noise and change in forces on the controls. Instrument information comes from the airspeed indicator, rate of climb indicator, artificial horizon, and directional gyro. The main analysor here is the visual analysor. Information delay time in this loop is greater than in the third, and may exceed 2 seconds.

The fifth loop includes data on change in parameters of position (H, L_x, L_z), that is, navigation information, which the pilot receives from non-instrument (spatial position of exterior references) and instrument (altimeter, DME, (NPP), and other readings) signals. In contrast to the others, of considerable importance in this loop are radio communications by ATC controllers and other aircrews on the aircraft's location. Visual information delay time is the greatest in this loop and may be as much as several seconds.

We should note that instrument information perception time in all loops is determined not only by the dynamics of change in parameters but also by sensitivity of the pilot's analysors. The greater it is, the sooner a pilot perceives a given change. Instrument signal reflection time in the consciousness also depends on instrument response.

Thus the dynamics of change in flight parameters and aircraft systems operation determines the character of the information coming to the pilot. And since changes in parameters have specific mechanisms, the temporal structure of flight information also conforms to them. Knowing the sequence of change in parameters when flying an aircraft, a pilot can, with the aid of an

information diagram, study all instrument and non-instrument signals and thus correctly plot an attention distribution configuration. In other words, while on the ground he can study and visually configure the space-time structure of information received during flight and can better prepare for a flight.

As we know, attention distribution and switching represent the directional thrust of a pilot's consciousness at a specific moment to perception of specific information. And not necessarily only visual. Important information comes via the motor, tactile, vestibular, and auditory analysors. The experienced pilot, for example, does not fix his attention on the altimeter immediately after pulling the controls back, since on the one hand the delay time for this information is fairly large, while on the other hand climbing is accompanied by change in parameters which he must hold precisely. Therefore the pilot initially checks the aircraft's behavior from signals of earlier loops. Which of these signals he utilizes (instrument or non-instrument) depends on his degree of proficiency and acquired skills. In other words, the structure of a pilot's attention distribution and switching in each loop is determined by amassed experience. Well-trained pilots to a greater extent utilize non-instrument, non-visual signals. Young pilots, however, for the most part fly on the basis of instrument, and less frequently non-instrument visual signals. It follows from the above that the information diagram makes it possible to devise a method of teaching pilots to distribute and switch attention taking into account level of proficiency.

The information diagram provides an opportunity to substantiate the undeservedly forgotten method of pilot training by instruments, which essentially boils down to the following: the pilot quickly determines, on the basis of changes in one or several parameters (instrument readings), what is happening to other instruments. This problem can be solved only if the interlinkage between parameters is known. It is evident in the diagram that the value of each parameter in the fourth and fifth loops, in contrast to the second and third, is determined by changes not in one but rather several parameters of the preceding loop. For example, roll rate (third loop) is determined by the lateral force applied to the joystick and by its displacement, while rate of turn (fourth loop) is determined by angle of bank, load factor, and airspeed. There also exists an internal interlinkage between parameters in these loops.

During the period of study of theory, the information diagram makes it possible to lay down the foundation for developing the ability to predict development of a flight situation. On the other hand, a lack of skills in utilizing intermediate-loop information creates, figuratively speaking, an information vacuum. This means that information begins coming to the pilot immediately after applying force to the controls, while the pilot is anticipating final information or initial changes in instrument readings. As a result, information is lacking, as it were, between control effort and instrument readings. In our opinion precisely this is one of the main reasons for uncoordinated control movements and delay in the pilot directing his gaze at any one source of visual information.

If we prepare an information diagram for special cases, we can precisely determine the dynamics of information coming to the pilot, information sources, and prepare recommendations on attention distribution and switching in these conditions. Naturally one can also concretize those drills which are most

expediently practiced on a simulator. Based only on its performance characteristics, one can state that it lacks many instrument signals which conform to the third, fourth, and fifth loops. Therefore those drills during performance of which in actual flight monitoring of parameters is accomplished for the most part on the basis of non-instrument signals, should not be recommended for practice on the simulator, since the forming of bad habits is entirely possible.

An information diagram will also help in training wingmen. As we know, changes in formation parameters are not detected immediately, and therefore a pilot flies his aircraft based initially on information of the first through fourth loops, which has the same structure as in single-aircraft flight. There are specific peculiarities only in the fifth loop, since flight formation parameters change alongside position parameters. Consequently, having executed a control movement, a wingman checks its immediate result and predicts the end result from sensations of the motor, tactile, auditory, vestibular and, to a certain degree, visual analysors. And only after reaching a threshold change in distance does the pilot evaluate the end result of his actions, relying entirely on visual perceptions.

Thus if a pilot has a good picture of what information is the most important for him, where, when, at what stage of flight, one can be assured that his skills in attention distribution and switching will be solid and reliable, and this will unquestionably produce cleaner and higher-quality flying in all conditions.

3024
CSO: 9144/0035

QUICK NAVIGATION PROBLEM SOLVING DEVICE DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9, Sep 83 (signed to press 1 Aug 83) pp 19-20

[Article, published under the heading "The Reader Suggests," by military pilot 1st class Lt Col A. Shatilov: "Assisting the Navigator"]

[Text] Engineer-navigator flight calculations for today's aircraft are a complex and laborious process, which require considerable time, especially when planning flight operations and cross-country flights on new, unfamiliar routes. Customarily such calculations incorporate a substantial fuel reserve. But when performing engineer-navigator calculations for familiar routes, aircrews sometimes get careless, which can lead to a dangerous situation.

Sometimes when inadequate time is available, inaccuracies creep into engineer-navigator computations, due to change in per-kilometer fuel consumption based on aircraft en-route weight, altitude, speed, wind direction and velocity. Calculations are not always refined when information is received on predicted or actual winds aloft or with a change in winds aloft. A special situation develops when significant changes occur in flight mode and configuration and in weather conditions.

For example, when redirecting an airborne aircrew to an alternate field, a commander has only a few minutes to make his decision, while 10 minutes or more are required to refine engineer-navigator computations during a flight. Thus accurate engineer-navigator computation is virtually impossible while airborne. Ground control facilities are also frequently unable to offer rapid assistance to an aircrew.

In order to speed up and simplify engineer-navigator computations, one can employ a device made specifically for the Il-76 aircraft. By refiguring the level flight, climb and descent scales, it can also be used for aircraft of other types. This device enables one to perform engineer-navigator computations with any flight configuration, in 2-4 minutes, without turning to reference data or calculators. It enables one to figure in all factors which affect fuel consumption: flight mode and configuration, change in aircraft weight as fuel is consumed and personnel and cargo are dropped; fuel consumption and flight path (if it is a route segment) during climbout and descent; effect of winds aloft on per-kilometer fuel consumption as well as effect of employment of anti-icing system. It can be used to solve a number of essential navigation and mathematical problems.

This device consists of an easy-to-use calculator tool. It consists of a fixed component, a slide, a runner with scale and groove, and a rotating segment. The fixed element carries two flight distance scales running from 0 to 6,000 and from 6,000 to 12,000 km. These scales can be used to add together the distances covered at different stages of a flight.

The speed and distance scale (V 9/10) on the fixed element is used for solving wind triangle problems, with determination of tailwind and headwind components, as well as other problems connected with plotting wind triangles. The S scale for time in seconds is intended for determining distances in meters (tens, hundreds), kilometers (tens, hundreds) with change in time in seconds (speeds in km/h or m/s). The reverse side of the fixed element carries keys to engineer-navigator, navigation, and mathematical computations, as well as reference information.

The runner carries 12 level flight scales. Graduation marks indicating decreasing aircraft weight, as fuel is consumed, for maximum range configuration, match the scale of distances. Factors indicated in parentheses figure in change in speed to maximum. Indicated airspeeds for maximum range and speed configurations are placed at the beginning of each level flight scale. If the speed at which the flight will be flown falls within the range of indicated speeds, the factor decreases proportionately. It is set on the "% decrease" scale of the segment for figuring in difference in speed from maximum range flight configuration.

Climbout scales are calculated for each flight altitude to match the range scale. Aircraft weight during climbout is indicated in the upper part, and fuel consumption in the lower part. On the "descent" scale, which is calculated in like fashion, altitude of start of descent is indicated in the upper part and fuel consumption in the lower.

The scales on the segment and runner make it possible to plot wind and other triangles; to figure changes in flight configuration, switching-on of anti-icing and deicing systems (the "% decrease"scale), per-kilometer fuel consumption with a headwind and tailwind component; to determine flying time and distance based on known speeds and flying time; to figure and convert flying speeds (km/h and m/s), relative wind direction and drift angles. Distances covered can be added up with the aid of the segment scales.

The computation keys are fairly simple and if necessary can be supplemented for clarity of representation in solving all problems.

This device is being profitably used by personnel enrolled at the Air Force Academy imeni Yu. A. Gagarin and by aircrews flying the Il-76 aircraft.

3024
CSO: 9144/0035

EFFICIENT FLIGHT OPERATIONS SCHEDULING URGED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9, Sep 83 (signed to press 1 Aug 83) pp 20-21

[Article, published under the heading "The Reader Continues the Discussion," by military pilot first class Lt Col V. Shishkin: "Economizing in Flying Hours"]

[Text] An article by Lt Col. V. Kroshka entitled "Has Reserve Potential Been Exhausted?" (AVIATSIYA I KOSMONAVTIKA, No 2, 1983) addressed very important questions pertaining to achieving savings in materials and reducing labor expenditures on pilot combat training support services. In connection with this I should like to share the experience of our unit.

Practical flight training indicates that with a thoughtful attitude toward things it is possible to save fuel not only on the ground but in the air as well. For example, senior flight technician Capt Tech Serv V. Lazarev devised a unique method of calculating minimum per-kilometer fuel consumption. Employment of this method, and also selecting optimal engine operating configuration, can result in savings of up to 2 tons of aviation fuel in just one full-range flight. This method can be used essentially on single-aircraft flights where the crew does not need to operate within a rigid time frame. Considering that military transport aircrews rather frequently run hauls with single aircraft, such savings can produce substantial results. In the opinion of our experts, today's heavy aircraft should carry a special instrument which provides information on airborne per-kilometer fuel consumption.

Here is another, no less important matter. It sometimes happens that an aircraft hauls cargo a considerable distance but makes the return flight empty, as a result of which many tons of aviation fuel are consumed, as pilots and navigators put it, "hauling air" in the cargo space. Each hour of such an empty-run flight is too costly. Mistakes and miscalculations in planning air hauls cause not only considerable financial loss but do moral detriment as well.

In addition, fuel can be saved on the ground as well. Very interesting in this respect is an article by Engr-Lt Col V. Dorofeyev entitled "Kilograms Make Up a Ton" (AVIATSIYA I KOSMONAVTIKA, No 3, 1983). Although the author is talking about fighter aircraft, his method of computation is also applicable to transport aircraft. Cases still occur fairly frequently where several aircraft with engines running stand for an extended period of time on the taxiway, waiting their turn for clearance onto the active. Usually such "bottlenecks" occur due to errors in scheduling takeoffs.

A great deal depends on the air traffic control team and the aircrews in ensuring a smooth rhythm to flight operations. With heavy traffic in the terminal area, if a single aircrew deviates from its position in the pattern, a pileup of aircraft on the taxiway is inevitable. A bottleneck also forms if, after landing, an aircrew incorrectly utilizes braking procedures and delays on the active. Naturally the next aircraft in line cannot take off on schedule, which in turn causes problems for the next aircraft on final.

The flight operations officer plays an important role in ensuring a smooth rhythm to flight operations. Lt Col V. Garanin, for example, almost never has aircraft standing on the ground waiting to be sequenced. This officer has the ability to demand a great deal and to plan and schedule in detail. Possessing a great deal of work experience, at a difficult moment he puts himself in the pilot's place, as they say and, estimating the situation, gives the necessary command in a prompt and timely manner. Predicting change in the air and ground situation, Garanin regulates aircraft traffic on the taxiways and, when necessary, uses an alternate runway.

Premature replacement of aircraft engines also does great detriment to combat readiness. For the most part engines must be changed due to foreign objects entering the air intakes. It sometimes happens that certain pilots fail to keep a proper distance when taxiing, remain too long in a zone of intensive icing, and fail closely to watch the bird situation. In addition, in my opinion experience and know-how in economizing in materiel are at the present time not being sufficiently publicized. Aviation personnel have only a very approximate knowledge of the cost of the aircraft they operate, the cost of an aircraft engine, munitions, and the per-hour operating cost.

Today's aircraft represents enormous labor by scientists, engineers, technicians, and workers. And therefore we have a great obligation to fulfill. Each and every minute in the air should be utilized with maximum effectiveness. It is important to remember thereby to achieve savings in each and every hour of flight time. A mission performed poorly is essentially a waste of the people's resources.

Considerable reserve potential for savings lies in reducing "unproductive flights," such as flights which do little to help improve aircrew proficiency. A well-conceived schedule provides first and foremost for efficient utilization of flying hours for young pilots to advance in their training program and for trained pilots to become more proficient. The schedules prepared by deputy squadron commander Maj V. Rozhkov, for example, are distinguished by rigorous purposefulness and, one might say, economy. He spends plenty of time on planning and scheduling, aware of the fact that in the final analysis this will generate definite savings in the nation's resources. Of course this officer is thoroughly familiar with the actual level of training of the squadron's pilots, takes into account deficiencies in flying technique, and at the same time eliminates thoroughly-mastered elements from practice activities.

Not so much time is allocated for planning and scheduling a flight operations day, especially since the work week is structured according to the following scheme: ground training and preparation-flight operations-ground training and preparation. Unquestionably the inadequate time available has a negative

effect on quality of planning. Means of automation and small-scale mechanization can help here. The fact is that officers still employ in planning and scheduling activities numerous graphs, logs, and sometimes office abacuses as well, which scarcely increases labor productivity. The task can be accomplished utilizing, for example, a computer of the Luch-74 system, magnetic scheduling tables, nomograms for calculating hours logged, books of blank standard planning tables and other auxiliary devices.

Practical experience indicates that adoption of means of automation and mechanization is also necessary at all stages of organization and analysis of flight operations. Analysis and critique with employment of projection equipment and specially prepared flight recording materials makes it possible to reduce labor expenditures in preparing for the post-flight critique, to make the presentation more graphic, and to reduce time required for analysis. The movie cameras, still cameras, and video tape recorders now in use greatly increase the effectiveness of pilot training, especially takeoff and landing. Movies or kinescope films make it possible to see errors visually. But the video tape recorder is the most promising device: immediately after landing a pilot can view a video tape and determine his mistakes, and consequently can take corrective measures immediately. With this method there occurs a significant decrease in number of gross errors and, as a consequence, the number of dual flights and check rides. Experience in using TV equipment in our unit indicates that a video tape recording produces the best effect when a pilot is working on mastering an aircraft of a given type, as well as in training young pilots.

Unfortunately not all units have modern equipment at their disposal. Apparently commanding officers are frightened away by cost of equipment, or else they are unable to comprehend that the cost of acquiring such equipment will soon be repaid. Calculations indicate that savings are achieved chiefly by reducing the number of unproductive flight hours logged, while time savings in preparing materials for after-flight critique analysis are obvious.

Enormous possibilities for achieving savings in resources are to be found in efficient utilization of flight and combined simultators in pilot training. Let us say, for example, that pilots are to practice flying in IFR weather with various instruments failing. Obviously an hour of work on the simulator is more effective than an hour in the air. The instructor, seated at his console, creates situations which are difficult and sometimes impossible to simulate in the air. Today's flight simulator makes it possible not only to practice flying skills but also to develop the ability to make the right decisions in various situations. The flight simulator is an effective means of testing a pilot's readiness to actually fly and to assess his reserve capabilities and intelligent responses in nonstandard situations.

Premature grounding of first-class pilots for reasons of health is a separate topic. Sometimes young officers on the training of whom the state has spent considerable funds are grounded because some units have failed to create conditions for taking part in athletics and inadequately publicize the desirability of having a long career of active flying duty and a healthy way of life.

The high demands imposed on professional training of aircrews make it necessary more extensively and persistently to incorporate into the training process the latest advances in science and technology and advanced know-how.

3024
CSO: 9144/0035

LANDING BOUNCE AVOIDANCE, CORRECTION ANALYZED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9, Sep 83 (signed to press 1 Aug 83) p 23

[Article by Candidate of Technical Sciences Engr-Maj N. Kurnyavtsev: "Multiple-Bounce Landing"]

[Text] The factors which cause a bouncy landing with progressively increasing bounce amplitude include touching down with the nose gear before the main gear, coming in too hot, incorrect movement of the controls on landing, plus others. Such incidents have been observed repeatedly in landing modern, highly-responsive aircraft. This has created a dangerous situation during the landing phase.

Let us analyze the specific features of landing at excessive speed a highly-responsive aircraft equipped with "floating" flaps.

Figure 1 contains a record of the flight parameters recorded by an SARPP-12 system in such a situation. Analysis of this record established that the pilot has touched down at speed V_1, which was greater than the touchdown speed V_t recommended for an aircraft of that type. After touchdown the aircraft rose from the runway surface and touched down five more times. The maximum impact load factor exceeded 3. The aircraft was in serious danger of a damaging mishap.

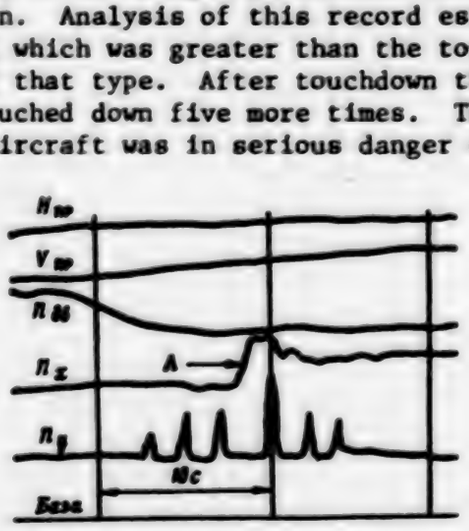


Figure 1. Record of Flight Parameters Recorded by SARPP-12 System During Landing

We shall examine the influence of an aircraft's structural features on lift. The lift coefficient during landing can be represented in the form of three components:

$$C_y = Cy_0 + \Delta Cy_{мех} + \Delta Cy_{зем},$$

where Cy_0 is the lift coefficient of an aircraft without flaps, with a landing angle of attack α_0; $\Delta Cy_{мех}$ -- increase in aircraft lift coefficient with flaps extended; $\Delta Cy_{зем}$ -- increase in aircraft lift coefficient as a consequence of ground effect. Wing lift capabilities cannot be fully utilized on landing due to the limited range of angles of attack. Maximum angle of attack is usually limited in order to avoid touching the runway with the tail. As a rule it is approximately 15 degrees for modern highly-maneuverable aircraft. Various high-lift devices are employed to increase the wing's lift capability: leading-edge slots and slats, nose flaps, trailing-edge flaps, etc.

As we know, deflection of flaps by angle $\delta_з$ leads to an increase in pressure on the lower surface of the wing and reduced pressure on the upper surface. In this case lift increases by amount $\Delta Y = \Delta Cy_{мех} Sq$. The increase in lift coefficient when employing flaps is determined by their angles of deflection (Figure 2). At small angles the relationship between increase in $\Delta Cy_{мех}$ and $\delta_з$ is linear. With an increase in angles, however, this relationship becomes nonlinear as a consequence of development of flow separation on the upper wing surface.

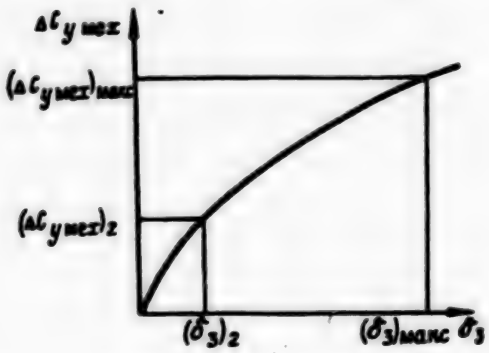


Figure 2. Effect of Flap Deflection Angles on Coefficient $\Delta Cy_{мех}$.

Increase in wing lift when flaps are lowered leads to the development of a large diving moment. To correct it it is necessary promptly to deflect the stabilizer to bring the nose up. Delay causes a drop in altitude, which is dangerous close to the ground.

So-called "floating" flaps are employed on an aircraft of this type in order to counter the effect of diving moment when the flaps are lowered. Their deflection angles depend on airspeed. When flaps are lowered, for example, at an indicated airspeed of V_2, they can be deflected only by an amount $\delta_{з2}$ (Figure 3). This will result in an increase in wing lift coefficient by $\Delta Cy_{мех2}$ (Figure 2). It is much less than $\Delta Cy_{мех_{макс}}$.

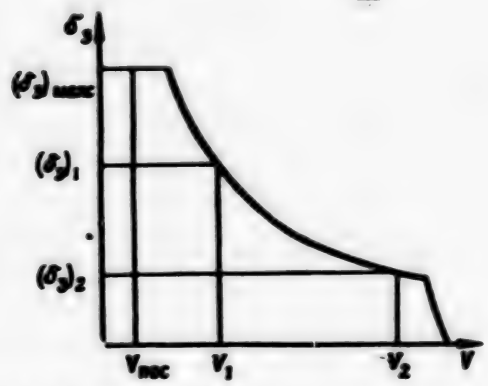


Figure 3. Nature of Relationship $\delta_3=f(V)$.

Wing lift capability also increases during flight close to the ground as a consequence of ground effect. A kind of air cushion is formed under the wing, particularly under a wing with flaps extended -- a zone of elevated pressure. The velocity of the airstream above the wing increases, which leads to additional underpressure. This causes an increase in an aircraft's lift coefficient during flight close to the ground. The amount of lift coefficient increased due to ground effect $\Delta Cy_{зем}$ for a specific wing depends on relative distance

$$\bar{h}=\frac{h}{l},$$

where h is the distance from the trailing edge of the flaps to the ground; e -- wingspan.

The nature of relation $\Delta Cy_{зем}=f(\bar{h})$ is shown in Figure 4. For an aircraft of this type, $\Delta Cy_{зем}$ reaches 0.2-0.3 at the moment the wheels touch the runway.

Figure 4. Effect of Distance from Flap to Ground on Coefficient $\Delta Cy_{зем}$.

Let us return to Figure 1. At the moment of initial touchdown the aircraft's speed, as stated above, is V_1. Flap angles are $\delta_{3|}$. Flap angles increased with decreased speed. The wing lift coefficient also increased correspondingly.

Increase in ΔCy due to ground effect and an increase in flap angles led to separation from the runway surface. Scarcely had the aircraft begun climbing, the wing lift coefficient decreased and the force of the aircraft's weight became greater than lift. The aircraft again touched down, and the cycle

repeated. But the impact load factor increased with each touchdown, that is, a progressing sequence of bounces was occurring. This continued until the pilot released the braking parachute (position A in Figure 1). Although the aircraft bounced three more times after chute release, the impact load factor was diminishing.

What are the conclusions? When executing a landing it is essential strictly to adhere to the recommended final approach speeds. If approach speed differs from the recommended speed, appropriate measures should be taken. If this is not possible, it is advisable to abort the takeoff and commence a go-around.

3024
CSO: 9144/0035

DUSTY-AIRFIELD AIRCRAFT SERVICING AND MAINTENANCE

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9, Sep 83 (signed to press 1 Aug 83) pp 26-27

[Article, published under the heading "Know-How of the Finest Into the Combat Arsenal," by Engr-Maj O. Gugnivenko, regimental deputy commander for aviation engineer service: "On a Dusty Airfield"]

[Text] "Afghan"! The phenomenon of nature bearing this name is well known to everybody who has been stationed in our district, situated in the southern part of the country. It is a windstorm which raises tons of sand and dust into the air. As a rule it comes up unexpectedly and may rage on for several days before abating. The wind blows at a velocity of 17-25 meters per second, and sometimes more. If necessary measures are not promptly taken to protect equipment against the dust, which gets into everything, many thousands of parts will be damaged, including the calibrated pitot-static system openings, which is particularly dangerous, for this can cause failure of the altimeter, airspeed indicator, and other aneroid-diaphragm instruments. An "Afghan" also adversely affects operation of the air intake control system, blow-in and spill door control system, and can bring a powerplant down. In the years I have been stationed in this region, I have encountered such cases time and again.

High winds and dust storms unfortunately are not the only way sand and dust get into an aircraft. Experience indicates that personnel are also frequently to blame, when they ignore prescribed procedures.

I once witnessed the following. At a field airstrip, fighters were deployed along one side of the flight line, and on the other -- helicopter gunships designated to participate in a tactical air exercise. When the helicopter engines were fired up to check operation, the air blown by the main rotors broke up the top soil layer. A mass of dust rose above the helicopters. Unquestionably the dust would do considerable harm to airplanes taxiing by. The command authority immediately changed the direction of takeoff for the fighters. But this could have been foreseen in advance, and appropriate precautionary measures could have been taken.

I recall another incident. When inspecting a fighter-bomber, officer S. Tagan detected in the air inlet duct typical indications that sand had entered. He

immediately reported his findings to the squadron deputy commander for aviation engineer service. Party member Tagan is known in the regiment as a diligent technician, who places high demands on himself and his men. He conscientiously follows the prescribed standard servicing and maintenance procedures as well as other guideline documents. He maintains the flight line and ground equipment in flawless condition, and he uses every means possible to protect the airframe, engine and cockpit from dust and sand.

The engineers tried to determine how the mistake had been made. They were able to establish the following. The previous pilots who had taxied out for a take-off as a two-aircraft flight had reduced spacing between the aircraft along a certain segment of the taxi route. The lead aircraft's exhaust had blown up soil particles, and they had gotten into the engine. It had to be removed and sent to an overhaul enterprise for takedown inspection and replacement of damaged parts.

Such negligence and ignorant actions by personnel are quite costly. It is also a costly business for those persons to blame for premature powerplant takedown. In addition to disciplinary punishment, they are made financially liable.

But it is entirely possible to protect equipment against dust. One is convinced of this by the experience of such vanguard officers as Ye. Prasolov, V. Taradetskiy, V. Popov, Ye. Samorukov, and others. These specialists have demonstrated in a practical manner that thorough knowledge and absolute adherence to precautionary measures, a high level of discipline and follow-through help aviation engineer service personnel intelligently maintain modern aircraft systems and prevent undesirable consequences.

Each day aviation engineer service supervisors get the weather forecast from Capt M. Lopatin, chief of the regimental meteorological service, and inquire to determine whether threatening phenomena have been recorded at locations adjacent to our area. This is especially important to know in the spring and fall months when, as observations have shown, winds are of a persistent nature. Comprehensive analysis of the weather situation enables us, when an "Afghan" is forecast, promptly to install protective devices, to employ additional covers on aircraft and equipment on the flight line and, if necessary, to disperse aircraft and deploy them at the best location.

In addition, practical experience in equipment operation indicates that it is necessary thoroughly to inspect the zero stages of aircraft engine compressors not only after a day's flight operations but also after every flight. Particularly since fighter-bomber crews frequently must perform combat training missions at low and extremely low altitudes, firing and bombing on a range wreathed in a ground-adjacent dusty haze. And there have been cases where aircraft have entered a vertically-rising dust cloud. This is why it is essential for a fighter-bomber ground technician to make sure that the air inlet ducts are clean and that there are no nicks on the compressor blades.

Experienced ground crew technicians are in no hurry to remove the air intake safety covers if adjacent aircraft are commencing to taxi out to the active. There may be small chips or sand in the joints between the concrete slabs, in spite of the fact that specialists from the airfield service company have carefully readied the airfield for flight operations. Some young ground crew

technicians, at this stage of ground servicing and maintenance, have attempted to fire up engines without having removed the exhaust covers. Why? Carelessness, and excessive haste. We fashioned strips of red cloth to attach to the covers. These simple warning devices remind ground crewmen that not all preparatory operations have yet been completed prior to firing up the engine.

Other preventive measures have also been taken. An additional item has been added to the preflight aircraft technical inspection list covered by the station duty officer: they are to keep an eye out to ensure that aircraft taxiing to the active maintain adequate forward spacing between aircraft, do not get dangerously close to one another on the taxiway, do not run off the pavement onto the dirt, etc. The duty officer immediately reports the slightest breach of procedures to the senior flight operations engineer. Any deficiency results in a serious discussion. At post-mission critique sessions and at flight operations technical conferences flight personnel, especially young aviators, are in these instances given additional coverage on safety rules and regulations when operating from dusty fields.

Success depends in large measure on people's conscientiousness and sense of responsibility for mishap-free flight operations. Bearing this in mind, Lt Cols A. Parkhunov and N. Tregubov as well as other political workers focus party organizations on effective indoctrination of aviation personnel and a determined campaign against all breaches and violations of military and process discipline. Technical maintenance unit chief Engr-Maj V. Kotsebchuk, for example, spoke recently at a party commission meeting. Ground maintenance specialists under his supervision had practically ruined an aircraft engine. The just criticism had a beneficial effect. Open regimental party meetings are always attended by representatives of the independent airfield technical support battalion. Complaints about the quality of preparation of the airfield for flight operations are sometimes leveled at them.

Recently we have improved the state of affairs in the technical maintenance unit. Rear services personnel have also taken the critical comments to heart: now a vacuum-cleaning vehicle periodically, not only just prior to flight operations but also during a day of flight operations, cleans the pavement where servicing and maintenance are performed, in front of aircraft air intakes, as well as the joints between pavement slabs. This work is always checked by the airfield technical support duty officer.

Supervision of vehicle movement on the airport has also improved. As a result, drivers are better about keeping to the specified routes and are keeping on the pavement. Before driving onto the flight line, taxiways and runways they remove dust and sand from their tires at an inspection and washing station which was set up at our request.

Efficiency innovators are also taking part in the campaign for flight operations safety. They are doing a great deal toward building and improving training facilities. One can see this on visiting the classroom building, the classrooms and laboratories. Specialists have placed explanatory text on the units and assemblies on the display stands: these texts explain how they should best be serviced and maintained, how often preventive maintenance should be performed,

how to detect the presence of sand and dust from the slightest indications, and what additional protection is employed by experienced aviation personnel of our unit and other units. Accompanying text on the display stand containing defective parts states who was responsible and why. Efficiency innovators have set up an aircraft engine instrument inspection laboratory. It is extensively utilized by aviation engineer service personnel during fighter-bomber preflight servicing.

Difficulty of aircraft servicing and maintenance on a dusty airfield is no obstacle to a competent and skilled specialist. The successes achieved by the majority of our ground maintenance technicians and mechanics during the summer training period graphically attest to the fact that aviation engineer service personnel have become enriched with experience in servicing modern aircraft in difficult conditions and have acquired fine professional and moral-psychological conditioning.

3024
CSO: 9144/0035

WEATHER SPECIALIST SUGGESTS PROCEDURES FOR PREDICTING ICING CONDITIONS

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9, Sept 83 (signed to press 1 Aug 83) pp 28-29

[Article, published under the heading "To the Pilot on Meteorology," by Candidate of Geographic Sciences Engr-Lt Col V. Nesteruk: "Icing Forecast"]

[Text] Just prior to the night flight operations the duty weather forecaster, Capt Tech Serv A. Mart'yanov, preparing his weather forecast, concluded that there would be possible icing in clouds. The flight operations officer, preparing the weather reconnaissance plan, failed to attach proper inportance to this. As a result the reconnaissance aircraft was unable to determine icing levels in the vicinity of the airfield and en route.

Flight operations commenced. One of the Mi-8s departed. On approaching the second turnpoint, aircraft commander Capt V. Malykhin felt the controls jerk and pull. Soon the helicopter began to shake, and the cockpit glass began icing up. The pilot, however, continued the flight. Seventeen minutes into the flight Malykhin heard a characteristic sound, and realized that an engine had shut down. He reported this back to the tower and, on the tower controller's instructions, made a forced landing away from the field, in conditions of restricted visibility.

Something similar happened to the crew of another helicopter. Maj Yu. Drapak unintentionally entered clouds. Within 2 minutes one of his engines shut down. The aircraft commander aborted the mission, returned to the field and landed on his other engine, which was still operating. The ground maintenance specialists concluded that in both cases icing had been the cause of the engine shutdown.

Helicopters carry effective anti-icing and deicing systems and, if these systems are not switched on, icing remains a dangerous phenomenon. The main rotor, projections on the fuselage, the cockpit glass, and the turbine engine intakes are subject to icing.

Icing depends chiefly on the size of the supercooled droplets, water content of the clouds, and angular velocity of the rotor blade. Light icing is occurring when the rate of ice buildup does not exceed 0.5 mm/min, moderate -- 0.6-1.0 mm/min, and heavy icing -- more than 1.0 mm/min.

When estimating the degree of main rotor icing, aircraft commanders should bear in mind that icing occurs much more intensively on rotor blades than on the fuselage. This is due to the fact that the integral path of a rotor blade in an icing zone averages 3.5 times that of the fuselage. Modeling was used to obtain a formula to estimate intensity of blade icing:

$$I=3.5r\ 10^{-2}\ wV,$$

where I is intensity of icing (mm/min); r -- radius of blade element in tenths; w -- cloud water content (g/m^3); V -- airspeed (km/h).

In the temperature range from 0 to -12°C, the amount of ice accretion on rotor blades per unit of time depends on cloud water content, rpm, and main rotor blade element radius. Cloud water content, and therefore intensity of blade icing as well decrease with a drop in temperature. Up to 0.3-0.4 radius icing intensity increases even with constant water content. Closer to the blade tip ice accretion ceases due to kinetic heating of the blade surface as a consequence of adiabatic compression of the boundary film of air and airstream friction. For this reason probability of blade tip icing is only one eighth to one tenth that of icing at blade midpoint.

In order fully to estimate intensity of main rotor icing, it is also necessary to consider thermodynamic conditions of blade operation. Figure 1 shows the relationship between blade element kinetic heating and its radius at rated rpm. The following regression equation was derived by mathematical simulation and full-scale in-flight experiments:

$$R_r=\frac{507.63}{n}|t|0.53,$$

where R_r is ice-accreted blade radius (m); n -- rotor rpm; t -- icing environment temperature (°C).

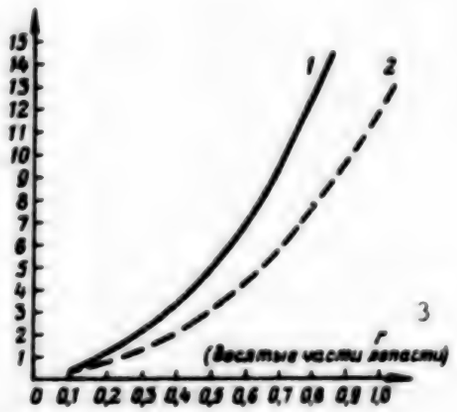


Figure 1. Relationship Between Kinetic Heating of Helicopter Main Rotor Element and Its Radius at Rated rpm

Key:

1. In dry air
2. In clouds
3. Tenths of blade

This equation shows, for example, that the lower the temperature of the icing zone and the slower the rotor rpm, the more of the blade ices up.

For purposes of forecasting one can use a graph (Figure 2), in which it is evident that at a temperature of -1°C one third of the blade ices up, and at -3°C -- one half of the blade ices up. Ice accretes along the entire length of the blade only at a temperature of -12°C.

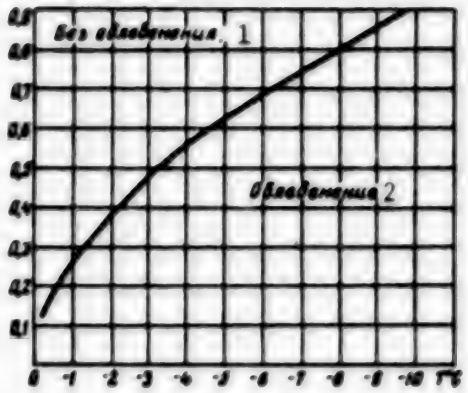


Figure 2. Graph of Helicopter Main Rotor Icing Forecast

Key:
1. No icing
2. Icing

Estimating and forecasting helicopter engine icing at temperatures above freezing is a more difficult problem. A graph was obtained with the aid of mathematical modeling and in-air experiments for estimating helicopter turbine intake icing (Figure 3). The ambient air temperature is placed on the Y axis, and helicopter airspeed on the X axis. The dashed boundary line indicates the upper temperature limit at which icing is possible, while the solid line divides light from heavy icing. It is evident from the graph that the slower the airspeed, the greater is the icing temperature range.

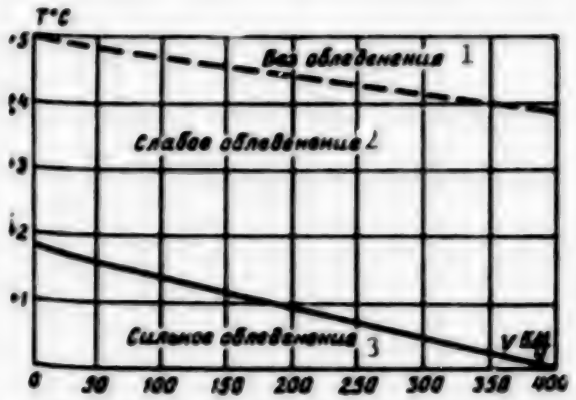


Figure 3. Graph for Forecasting Helicopter Turbine Intake Icing at Above-Freezing Ambient Air Temperatures

Key:
1. No icing
2. Light icing
3. Heavy icing

As practical experience indicates, engine icing occurs more frequently at slow airspeeds and when hovering, when air is not being rammed into the inlets, while adiabatic cooling in the inlet duct reaches maximum values.

It is best to forecast helicopter icing as follows. First one forecasts the spatial characteristics of cloud cover and precipitation, and then determines temperature by altitude, especially in clouds and precipitation where temperatures will be below 5°C and, finally, one then forecasts precipitation and type of precipitation, focusing particular attention on supercooled-droplet precipitation.

An aerological diagram can be helpful in predicting icing. In analyzing such a diagram one must direct attention to those layers where the $t-t_{\alpha}$ difference does not exceed 0-1.5 km: 1.5°C; 1.5-3 km: 1.7°C; 3-5 km: 2.3°C, since clouds in these layers are characterized by high water content.

It is also advisable to study the change in temperature-dew point spread with altitude. If temperature in clouds drops uniformly with increase in altitude while the spread increases rapidly, icing in that area is light or absent. When a layer of separation (inversion, isothermy) is discovered in the atmosphere, however, while the dew point spread decreases with altitude (assuming the least values at the lower boundary of the separation layer), there will be a zone of moderate and heavy icing under the layer of separation. If the dew point spread continues to diminish under it, moderate and heavy icing will be observed below or in the layer proper. When at altitude transition to a more rapid temperature is accompanied by a decrease in dew point spread, one should anticipate heavy icing.

The AT_{925} hectopascal map must be used for predicting icing. It enables one to estimate distribution of temperatures and air temperature-dew point spread along the route of flight and to determine where icing in clouds will occur.

From the standpoint of the weather specialist, the pilot can be recommended the following (of course bringing these recommendations into conformity with rules and regulations). Using aviation weather forecast materials, the pilot should thoroughly study the weather situation in the airfield area, in the direction of departure and approach, as well as en route. He must determine in what weather conditions the flight will be taking place, at what altitudes cloud bases and tops will be, and location of the 5, 0, -3, and -12°C isotherms. He must bear in mind that engine icing occurs at temperatures of 5°C and below, structural icing begins at 0°, -3° corresponds to half-icing of airfoils, and at -12°C rotor blades ice up from root to tip.

If the flight path will be passing through convectional cloud cover (stratocumulus and stratus), maximum intensive icing is possible in the upper part of the clouds.

Light and moderate icing is observed along a warm front in the lower part of nimbostratus clouds. The most dangerous icing along a warm front occurs under clouds in supercooled rain precipitation.

In a cold-front cloud cover zone, especially in developing clouds, icing as a rule is very intensive, and therefore it is recommended that such areas be crossed at low altitudes. The anti-icing system should be switched on before entering an icing zone, and even insignificant ice accretions should not be ignored. Indications of heavy icing: rapid ice buildup on the visual icing indicator and on the cockpit glass, as well as a drop in indicated airspeed. It is important to remember that rotors can ice up in fog and damp air during checking of helicopter systems after firing up the engine, during taxiing and hovering.

It is recommended that during flight the anti-icing and deicing system be switched on 2-3 minutes before entering a potential icing zone to a cycle corresponding to the outside air temperature: at -5°C -- for 20 seconds, from -5°C to -10°C -- for 40 seconds, and at -10°C and below -- for 60 seconds.

When ice appears on the cockpit glass, standard indicator and other projecting parts of the helicopter, regardless of outside air temperature in the icing zone, the deicing system must be switched on for 5 minutes, after which it should be switched to a cycle corresponding to the outside air temperature.

In view of the high degree of sensitivity of helicopter turbine inlets to icing, in damp air it is recommended that the anti-icing and deicing system be switched on manually at a temperature of 5°C and below. It is advisable not to fly in moderate and heavy icing conditions at temperatures below -12°C.

In order to avoid unexpected engine inlet icing, flights in damp air at temperatures of 5°C and below should always be with the anti-icing and deicing system switched on manually, since during the time it takes to heat up an air inlet, a crust of ice can form, which subsequently melts and enters the air intakes.

We believe that the suggested prediction methods and recommendations will help weather specialists and pilots in their work, which unquestionably will help make flight operations safer in various weather conditions, day and night.

3024
CSO: 9144/0035

MOCK HELIBORNE ASSAULT DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9, Sep 83 (signed to press 1 Aug 83) p 29

[Article by G. Il'ina: "Tactical Skill of the Commander"]

[Text] The situation at the exercise became more complicated. The "aggressor," foreseeing the development of events, advanced a motorized rifle combined unit into the designated breakthrough area. By evening intelligence reported that combined unit headquarters, with a small security detachment, had separated from the main forces and had set up operations at the base of a ridge. At this point a bold thought suggested itself: deliver an assault force at dawn, wipe out the headquarters and strip the "aggressor" of command and control.

Who should be assigned execution of this mission? The command authorities decided on Lt Col Yu. Filyushin and his men, and for good reason. Military pilot first class officer Filyushin had expert knowledge of combat tactics, possessed a wealth of experience in nap-of-the-earth flying, and was capable of quickly sizing up the situation and making intelligent decisions. Time and again he had mounted bold attacks, placing the "aggressor" in a difficult predicament, and he had always emerged victorious.

His men were worthy of their commander. They had learned a great deal from him, and they possessed a consummate mastery of effective kinds of maneuver.

The pilots and navigators, under the direction of Yu. Filyushin, thoroughly studied the route to the objective, used large-scale maps to determine the route profile, taking maximum concealment into account, and rehearsed the mission by "walking through." The commanding officer personally determined the readiness of each pilot for the mission.

The force took off early in the morning, observing radio silence. The commanding officer took the lead. His helicopter, screened behind intervening terrain, approached the target at maximum speed. The other helicopters followed behind. The sudden, unexpected appearance of the helicopters and their heavy delivery of fire stunned the "aggressor." The assault troopers, attacking swiftly, seized and "destroyed" command and staff vehicles, disoriented command and control of the units, and thwarted a planned imminent counteroffensive.

At the postexercise analysis the senior aviation officer noted the innovative approach taken by Lt Col Yu. Filyushin to execution of the mock combat mission and cited his resolute actions as an example to all aviation personnel.

3024
CSO: 9144/0035

GROUND MAINTENANCE OPERATIONS DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9, Sep 83 (signed to press 1 Aug 83) pp 30-31

[Article, published under the heading "Marching in the Vanguard," by Col V. Lebedev: "Engineer's Calling"]

[Text] It is no easy matter to find Engr-Lt Col P. Nosach, regimental deputy commander for aviation engineer service, in his office: he has no time to sit around at headquarters, spending a good part of his time at the airfield. I again was approaching the door to his office, which was painted dark brown. It looked like somebody was in.

Petr Antonovich was seated behind a desk with a nicely polished surface. A white sheet of drafting paper lay on the desk. It was evident that the officer was busy with an engineering drawing.

The engineer greeted me warmly and readily entered into conversation. Slightly narrowed, alert gray eyes peered out from under whitish brows. The officer's temples were prematurely grayed. A finely tailored uniform jacket hugged his well-built physique. Even rows of ribbon bar holders were pinned on the left side of the jacket. Decorations included the "For Service to the Homeland in the USSR Armed Forces," 3rd class.

"Take a seat," Petr Antonovich offered and, glancing at the drawing, said: "Excuse me, I shall soon be finished, and then I shall be at your service."

We had a long conversation. We discussed a recent incident which had occurred in the regiment: through the fault of a pilot, who had grossly failed to follow proper night landing approach procedures, one of his bomber's wheels touched an obstacle. It is true that nobody was injured, and the crew succeeded in landing the aircraft. But a wing and one side of the landing gear were damaged.

An acute question arose: would the technical maintenance unit specialists be able to repair the aircraft with their own manpower and resources? Would they be able not only fully to repair the damage in short order but also to ensure flawless aircraft operation on a long mission? Commanders and engineers thought the matter over. They reflected and estimated the capabilities of the regimental technical maintenance unit. Things were complicated by the fact that

the chief of the technical maintenance unit, Gds Engr-Maj M. Gutyrchik, happened to be away and his stand-in was a comparatively young officer.

Petr Antonovich had once been in charge of repairing an aircraft with similar damage, and damage which was much more severe.

What should they do? Gds Engr-Lt Col P. Nosach first of all thoroughly inspected and carefully studied the damaged parts, which had been removed from the aircraft. He was concerned by the state of the wing mounting assemblies. Fortunately, as a diagnostic examination confirmed, although they had been subjected to a considerable load factor at the moment of impact, they were undamaged. After this Petr Antonovich reconsulted knowledgeable experts, went to the parts warehouse and determined what they had available. He decided that his specialists could handle the job. "We shall repair the bomber with our own resources," decided party member Nosach. Not every unit aviation engineer service chief would dare make such a decision.

Gds Engr-Lt Col P. Nosach stopped by the aircraft several times a day, carefully inspecting each and every item, right down to an individual bolt. Nothing escaped his vigilant eye. He was fully aware of the difficulties for the officer assigned to supervise this responsible job, and he was confident that he would succeed in coping with the unusual task. Petr Antonovich does not recall a single case where he was mistaken about people. He is well acquainted with the professional abilities of his men and knows how to mobilize them and to help them fully to reveal their resources and abilities.

Party member Nosach has formed a good opinion of Engr-Sr Lt A. Zaytsev. This officer is young and lacks experience. But he has plenty of energy and zeal. He has a liking for equipment, and he quickly established a good working relationship with his subordinates. He was temporarily assigned the duties of technical maintenance unit chief. And the young engineer lived up to the confidence of his superiors. It was he who was entrusted with heading the team of specialists assigned to repair the aircraft. The team included several skilled technicians and mechanics of the squadrons' aviation engineer service.

All the following days were busy ones for the regimental deputy commander for aviation engineer service. There was plenty of reason for concern. The assigned timetable was tough, and there was a lot of work to do. Much depended on organization of the specialists' labor and on providing them with everything they needed. Engineer-Senior Lieutenant Zaytsev was doing his job well. Nevertheless party member Nosach assumed a considerable portion of the concerns. Petr Antonovich realized that it made more sense for him, for example, to work on obtaining the equipment needed by the specialists than to assign the job to somebody else. He was more knowledgeable on where to look for a given part or assembly and specifically with whom to coordinate the most difficult problem. And there were a considerable number of these. He did an efficient job of solving problems which arose.

This genuinely businesslike approach ensured success. The technical maintenance unit specialists worked hard. Gds Engr-Lt Col P. Nosach also worked highly productively. He marched at the spearhead of the assault, so to speak. If a problem cropped up, he would immediately come to the rescue. The bomber was returned to service on schedule.

I have repeatedly heard senior supervisors state the following: "Party member Nosach is a businesslike individual. He knows the equipment well, and he has the ability to communicate with others and focus their efforts on successful accomplishment of assigned tasks."

This means a great deal for the officer-supervisor, for he bears responsibility for an assigned job area. And his ability to supervise personnel, as well as the work style and methods he has assimilated play a paramount role. It is important not only to achieve mutual understanding and to establish a close relationship but also to be demanding and objective in assessing not only the labor of his subordinates but also his own actions.

"A great deal has been accomplished since Petr Antonovich has been in the regiment," stated officer V. Filanovich, and emphasized that the regiment's aviation engineer service chief does not make any big thing of this, stating that he is merely doing his duty.

Reflecting a moment, he continued: "But one still encounters engineer-supervisors who attempt to use various 'objective' factors to conceal their own sluggishness, lack of initiative, and sometimes outright inability to organize things innovatively. But that cannot be said of Petr Antonovich. He is a man of action. He always finishes a job, regardless of how difficult it may be."

As a Communist, as a member of the regimental party committee and, finally, as an officer-supervisor, Nosach is never satisfied with average performance results. At a final performance test, if any of the engineers is pleased with a mark of 4 which was just barely achieved, this sincerely grieves him, for if the inspecting officer had been stricter and more demanding, the grade could have been lower. Petr Antonovich adopted the following rule when he was first assigned to this job: he would work only with a high degree of accuracy and total effort, and he would maintain the aircraft and their complex systems in a continuous state of combat readiness. And this is not easy, for as an engineer he deals with highly complex instruments, automated control systems, and the potent weapons of a missile-armed bomber. This is why he is more demanding on those who do not have a sense of the new, who seek to work in the old way, who do not display initiative and innovativeness. After all, it still occurs, although rarely, that one encounters aviation engineers who are little concerned about the mark they will leave behind in the regiment.

The regimental deputy commander for aviation engineer service found his place in the collective rather quickly. From his very first days on the job he was able to feel that intense pulse of activity by the specialist-supervisor, from whom invisible threads run, linking him with men and equipment. If this invisible contact is weakened somewhere, there will inevitably follow problems on the job and discord between superior and subordinates.

Of course it is no easy matter to establish such a bond, and it can be severed by a single thoughtless action or incautious word, particularly since wrong actions by a person in authority immediately appear in a bad light in the eyes of his subordinates, and the slightest incorrect step by a supervisor is perceived by them on a totally different scale. In such a case proper demandingness

imposed with less than the best motives sometimes has a reverse effect.

Gds Engr-Lt Col P. Nosach is uncompromising and sets a high measure, giving subordinates an example worthy of emulation. He does not ignore those who perform their duties with less than full effort, and he treats with profound respect those specialists who work in a guardsman manner, who add to the fighting fame of the combat veterans by their soldierly deeds. And the aviation personnel have a good deal of which to be proud. For many years now the guards regiment has had no potential air mishap situations through the fault of aviation engineer service specialists. The military collective has been awarded prizes by the leading design offices for skilled mastery of complex combat equipment. And some of the awards have found a permanent home here.

Petr Antonovich sees as the main condition for success his men's attitude toward the assigned job. The formidable combat aircraft take off thanks to them, the tireless and modest airfield personnel. Returning to the flight line, the missile-armed aircraft once again come into their strong, caring hands. These people are dedicated to their job, faithful to the difficult profession of aviation engineer and technician. Their concerns are many and diversified. Very rarely do they admit to being under the weather, although they must work long hours on end out on the airfield, exposed to the harsh winds. They are not persons who take the first opportunity to point to various difficulties as excuses for failure. The main thing for them is that the aircraft are combat-ready.

Party member Nosach has many reliable and faithful assistants. They include vanguard officers Gds Engr-Maj I. Aleksandrov, V. Potepukh, and V. Vasil'chenko, Gds Capts Tech Serv A. Lyubtsev, N. Veselkov, and others. He can count on them at all times and in all things: they will never let him down, no matter how difficult a job becomes.

Time and time again Petr Antonovich has given thought to how to improve engineer working conditions at the airfield and how to make their labor more efficient. He noticed that it was necessary to go to headquarters to fill out some document. Time was spent traveling to and from headquarters, time which could be used beneficially for more important things -- more attention could be devoted inspecting and checking the condition of aircraft.

Following the next day of flight operations, Nosach summoned his assistants. As always, he was laconic: "It is high time to seriously address the matter of setting up an engineer command post. We shall construct a new building, a permanent-type, two-story structure."

Some people were even surprised at first: a two-story building! And every individual thought about what a troublesome project the service chief had thought up and how much work for unit personnel construction would mean. Nevertheless the officers supported the initiative. People were pleased with the foresight shown by Gds Engr-Lt Col P. Nosach. Summarizing the matter, he stated: "It is not fitting for us guardsmen to maintain an aviation engineer service command post in a ramshackle wooden building. After all, we spend an entire flight

operations work shift in this structure, and therefore it is high time to provide adequate conditions for our work."

Gds Engr-Maj I. Aleksandrov was assigned the job of supervising construction.

"Please submit all suggestions to Igor' Vladimirovich," instructed Nosach in conclusion.

Before making his decision, the deputy commander for aviation engineer service had weighed all factors and had made careful calculations. He estimated how much cement, bricks, lumber, paint, and plastic would be needed for the new building. He spoke about his idea with the administrative and supply people. Some were not particularly enthusiastic about his scheme: the job was not plan-targeted, and would require a great deal of short-supply materials. It was necessary to be persistent and keep arguing his point. Finally they came to terms. They got together and discussed how they should proceed and how they should finance the project.

The unit's engineers displayed a great deal of ingenuity and expended considerable energy on implementing the project. Everybody had to work hard. Now, however, with the building in operation, it is pleasant to spent time there. The aviation engineer service command post building has truly become the center for adoption of scientific organization of labor at the airfield. From here the duty engineer can confidently supervise the actions of the maintenance crews both during flight operations shifts and on days of preliminary preparations for flight operations. A "In-Flight Problems" information board has been set up at the command post, as well as an electronic console for making equipment combat ready on the "Assemble" signal, a wired airfield diagram with flight line and aircraft numbers, made of acrylic plastic, plotting boards for engineer-navigator calculations, alternate fields, and an "Operating Restrictions" display stand. Also on hand are tables with calculations for redesignating aircraft to other airfields, data on combat and transport aircraft and on the airfield. Plotting boards and display stands have been set up for the engineers under the following headings: "What Is to Be Done?," "Regimental Aviation Engineer Service Tasks for Improving Quality of Servicing and Maintenance and Aircraft Combat Readiness." The specialists built racks and cabinets for the work schedules, documentation, and technical literature. Everything was done neatly, elegantly, tastefully. Two tape recorders have been installed at the command post.

Exemplary order and cleanliness prevail on the squadron flight lines, and the fine condition of the locations where combat equipment is kept is pleasing. Power has been run to every aircraft. If engines must be fired up and aircraft must take off quickly, the aviation engineer service specialists always have everything they need right at hand.

Led by Engr-Lt Col P. Nosach, the service is successfully performing its assigned tasks and is maintaining a solid competition lead. It is evident from the actions of the regimental deputy commander for aviation engineer service that for Petr Antonovich Nosach being an engineer is not only a job but a calling as well. He is always searching for new improvements to help maintain the long-range bombers in a combat-ready state.

3024
CSO: 9144/0035

IMMEDIATE PILOT MISTAKE CORRECTION URGED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9, Sep 83 (signed to press 1 Aug 83) p 32

[Article, published under the heading "Constant Attention to Air Safety," by Maj V. Usol'tsev: "Hot on the Trail"]

[Text] From the window of the tall building squadron commander Lt Col V. Kostikov and young off-duty pilots were closely observing fighters as they shot landing approaches. Aviators say that if you watch 10 landings by other pilots, one of those is your own. In the squadron there are many new men who quite recently retrained onto a swing-wing fighter which was new to them. Naturally they make mistakes on landing approach and landing. And Lieutenant Colonel Kostikov, an experienced pilot and methods specialist, makes use of every opportunity to teach the young pilots.

A fighter had just landed. Turning to Lt S. Laptev, Vladimir Petrovich asked him: "What mistake did you notice?"

The latter thought for a second: "I believe he touched down a bit hot...."

"What do you think?" the squadron commander turned to another young pilot.

"I agree with Laptev. He was going a little fast."

The lieutenant colonel nodded in assent: "Right."

At this time another fighter on landing approach appeared above the horizon. It was Maj V. Verlin, one of the unit's best combat pilots, returning from the training area. The squadron commander briefly explained to the young pilots how the controls should be manipulated and what they should pay particular attention to in the present weather conditions in order to make a "clean" landing. And he instructed them to watch closely Major Verlin's approach. He indeed made a fine landing. One of the lieutenants could not contain his delight and exclaimed: "Outstanding!"

But now an aircraft piloted by Lt V. Bakurov was coming down the glide path. The fighter was coming closer and closer to the threshold. The aircraft passed through the height at which a pilot usually begins his flare. The

aircraft ceased its descent. An instant later a bluish little cloud of smoke erupted under the aircraft's wheels.

"Nominal," the squadron commander stated with satisfaction.

We know that improvement in pilot fighting skills and safe flight operations depend in large measure on how objectively pilot performance is evaluated, for if we have a tolerant attitude toward shortcomings and fail to wage a resolute campaign against them, any, even the slightest roughness in flying technique or in ground maintenance specialist performance can in time lead to other mistakes. And this will impede growth of combat skill. In those subunits where they do not ignore mistakes and where they endeavor to correct them promptly and to prevent their repetation by other personnel, the level of proficiency of aircrews and ground personnel is higher and air operations safety is better.

Once young pilot Lt M. Trukhanskiy, flying an intercept of a high-speed air target in IFR conditions, was unable to "hit" the "aggressor" aircraft on the first pass. The target, skillfully maneuvering, was getting away. He finally barely managed to accomplish his mission. Analysis of the pilot's performance could have been left until the postoperations critique. But other lieutenants were also flying intercepts during the same flight operations shift. It was important to prevent a repetition of the mistake. As soon as Trukhanskiy returned to the field, military pilot first class Maj V. Arkhipov instructed him to relate in detail what had happened in the air. After hearing his report, Arkhipov immediately realized what had happened. Apprehensive that the target might get away, the pilot, attacking from the rear hemisphere, switched on his radar sight in advance. A warning light flashed on in the "aggressor's" cockpit, informing him that he was being painted by radar. An experienced combat pilot would have no trouble thwarting the attack. It was a good thing that the novice pilot was being vectored to the target by first-class specialist Maj V. Snatenkov, who was able to foresee the target's maneuver and promptly communicated the required information for a second pass. Otherwise the intercept could have failed.

Pilots not on flight duty attended the critique session. A lively exchange of opinions ensued. The young aviators listened attentively to the experienced combat pilots. The point being made was that a pilot should precisely execute the commands of the GCI controller and switch on his airborne radar sight at a distance somewhat less than its resolution range. Then there will be less time to transition from detection to lock-on, which greatly helps gain the element of surprise.

Right on the flight line, Major Arkhipov worked with the young pilots on executing different variations of IFR-condition intercepts. Later they reinforced on the simulator what they had learned.

Mistakes were not repeated in the course of the flight operations shift, and the work done at the flight line helped save time at the general critique following flight operations. It was utilized for more effective accomplishment of other combat training tasks.

Exchange of know-how by the top combat pilots during a flight operations shift has become the rule. Military pilot first class Capt M. Malyshev, for example,

Yudin knew quite well what should be done in such a case: search for the missing screw until it was found, and if necessary disassemble all equipment in the bay. The officer did not do this, however. In addition, he did not even inform the technical maintenance unit senior supervisors. Giving a cursory glance to the wire bundles and briefly (more for the sake of form than result) checking with his hand to determine how securely they were fastened, the captain gave the order to install the radar.

This was a gross violation of maintenance procedures discipline and an indication of a formalistic and irresponsible attitude toward performance of his duties. This supervisor-instructor had given a bad example to his subordinates.

But what about the missing screw? It had found its way into a gap between the air intake duct and the intake cone body. During testing of the engine and checking the cone control system, the screw was swept into the engine by the stream of air.

But why is it that prior to firing up the engine neither the aircraft technician nor the specialists checking the engine's operation did not fully and properly inspect to determine that the intake was in proper working order? After all, this procedure is required by maintenance procedures documents, and every aircraft maintenance specialist must observe this requirement. Particularly since our airfield is constantly being hit by dust and sandstorms and heavy winds. The maintenance technicians and mechanics must painstakingly remove sand and other particles from various aircraft equipment and systems.

Did the officers know about this? They did, but nevertheless they inspected the air intake carelessly and perfunctorily. And the members of the commission which looked into the incident correctly stated that certain technical maintenance unit specialists are violating maintenance procedures discipline, while aviation engineer service officers are doing a poor job of monitoring the actions of their subordinates.

I recall my first mentor, flight technician I. Yevseyenko. He was a combat-toughened maintenance specialist, who well knew the price of efficiency. On one occasion during replacement of a landing gear, for some reason there were some "extra" parts left over. Party member Yevseyenko attentively listened to my report and then began questioning me on the sequence I had followed.

"Well, I can't fault you: you have conscientiously learned the procedures. But these parts did not just materialize out of nowhere. Therefore let's go through the process from the beginning."

Anybody who has worked on Il-28 bomber maintenance knows well what an enormous amount of work is involved in replacing a landing gear. We were exhausted, and in addition dusk had fallen over the airfield, and it was raining hard. But senior technician Lieutenant Yevseyenko was insistent. I shall never forget that hard object lesson. And never again did I divide technical operations into principal and secondary.

Why is it that today some aviation engineer service supervisors find themselves unable to demand flawless efficiency of their subordinates? I, for example, know some flight technical maintenance unit chiefs who would rather themselves correct a mechanical problem, adjust an assembly or even clean mud off an aircraft than compel a maintenance technician to do it. Some explain it as follows: it wasn't so long ago that I myself was a maintenance technician, working alongside everybody else, and it feels uncomfortable to be excessively demanding on my comrade, and particularly since we hold the same rank.

The error of such reasoning is obvious. Each individual has his own duties, and he should perform them faultlessly. This is a law which governs our military service. False shyness, the inability or disinclination of a person in authority to be demanding on subordinates are excessively costly both to the state and to the military collective.

The violation of required procedure was committed, and the guilty parties were punished. Now commanders and supervisors are working to prevent the occurrence of similar violations. If each and every technical maintenance unit specialist were careful and rigorously observed all the requirements specified in the documents describing aircraft maintenance procedures, an engine would not need to be removed from an aircraft prematurely. I would like all those entrusted with maintenance of modern combat fixed-wing and rotary-wing aircraft to draw serious conclusions for themselves from this incident.

3024
CSO: 9144/0035

returned after making an intercept at "ceiling." We know that at maximum altitude a fighter responds quite differently to the controls. Captain Malyshev, aware that it had been a long time since some of his fellow pilots had flown such a mission, shared his experience with them. He related in detail the specific features of intercepting a high-speed target at "ceiling," illustrated his explanations with diagrams, and drew certain elements on the blackboard. The pilots thought through the forthcoming practice mission in detail once more, revealed weak points in their preparation, and corrected them.

Other first-class pilots also shared their know-how with comrades. The flight commanders rehearsed over and over the sequence of performing the most complex elements of the training exercises and conducted training drills.

We should note that in the collective under discussion the ground maintenance specialists also use training time profitably. Supplementary classes on a schedule worked out in advance are held for maintenance technicians and mechanics in the intervals between inspections and fighter servicing between flights. These classes are conducted by acknowledged experts at their job Engr-Maj A. Glinskiy, Capts Tech Serv I. Pestryayev and V. Voytsekhovskiy. Ground maintenance specialists Sr Lts Tech Serv V. Dobryden' and I. Ukstin also frequently speak. In addition to scheduled topics, the causes of errors are discussed at classes, advanced work techniques are practiced, and the know-how of the top ground maintenance specialists is synthesized.

Excellent results have been achieved in Lt Col V. Kostikov's squadron thanks to precision organization of combat and political training and work activities, firm military discipline and follow-through, and proper interrelationships as prescribed by regulations. The commanding officer has been assisted in achieving this situation by his faithful assistants -- party and Komsomol activists, on whom he ably relies in his activities.

3024
CSO: 9144/0035

SLIPSHOD MAINTENANCE PROCEDURES CAUSE PREMATURE ENGINE TAKEDOWN

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9, Sep 83 (signed to press 1 Aug 83) p 33

[Article, published under the heading "This Could Have Been Avoided," by Maj Tech Serv N. Polushatov: "The Engine Had to Be Removed...."]

[Text] Nothing that day seemed to presage trouble. Performing routine maintenance on a fighter-bomber, the technical maintenance unit specialists were precisely adhering to the maintenance sequence schedule. All that remained was to check engine operation, and they could turn the aircraft back to the squadron.

Sr Lt Tech Serv V. Klyavdin, acting technical maintenance unit chief Engr-Capt M. Sotnikov, group specialist Sr Lt Tech Serv V. Abramov, and the other officers fully performed the preparatory operations, placed the mechanics at their stations, and proceeded with the concluding operation. The engine ran flawlessly. Nor did the test instruments indicate any problems.

After running up the engine, specialists closely examined the recording. It indicated a brief fluctuation in engine rpm at the moment of cone emergence. Examining the compressor, the officers spotted dents on the stator blades. The engine had to be removed from the aircraft and sent off to be repaired.

Quite frankly, this aircraft maintenance incident is unusual. It happened through the fault of aviation engineer service personnel. I, one of those who took part in the analysis of the reasons for the engine malfunction, was particularly upset. I have served for years in the fighter-bomber regiment and am well acquainted with many technical maintenance unit specialists. Many of them work selflessly and conscientiously and are highly skilled. But on this occasion it was essentially the experts who were to blame.

Our inquiry revealed the following. While performing routine maintenance procedures, Jr Sgt A. Khasanov, an aircraft armament group mechanic, removed a piece of equipment. While inspecting bundles of wires and plug connector mounts, he noted the absence of a fastener screw on a mount and immediately reported this fact to the officer in charge of the maintenance team, Capt Tech Serv V. Yudin.

IMPORTANCE OF TACTICAL SIMULATION AND MODELING EMPHASIZED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9, Sep 83 (signed to press 1 Aug 83) pp 34-35

[Article, published under the heading "Tactics and Modeling," by military pilots first class Cols Z. Nikitin and Yu. Kislyakov: "Are Models Needed in Tactics?"]

[Text] Simulation or modeling has been employed for quite some time as a method of scientific cognition in the area of military scientific investigation, personnel study, immediate preparation for and conduct of combat. In present-day conditions functional troop control models as well as models of combat operations have begun to be developed with the aid of computers and mathematical modeling. It is quite understandable that modeling could not ignore tactics, and therefore the agenda of the day includes the quesion of dynamic models of air combat, airstrike on a ground target (individual stages), or a combat air mission in general.

Spokesmen for various areas of aviation specialization have discussed this topic on the pages of this journal. They have not only shared their opinions on the questions which have been addressed, but have also given practical recommendations. Discussion pursued the following aims: first of all, to demonstrate the advantages of modeling and the possibilities of its employment in line units; secondly, to show how to utilize ready graphic models to streamline and speed up the process of preparing for a combat mission without diminishing quality; thirdly, to find ways to facilitate the labor of the pilot and commander in solving complex tactical problems. Analysis of experience in employing modeling in the training process enables one to estimate in advance the degree to which it helps combat pilots develop their professional and tactical intellect.

Modeling plays a very important role in research, design, and even indoctrination work. Engineers, teachers, and specialists connected in one way or another with using computers cannot imagine doing their job without the computer. Even in sports, in soccer, for example, "field models" have been developed -- models of placement of players and methods of conducting play on the adversary's field (not a military, but a tactical model). These advances, however, are not yet being coordinated very well with air tactics. And the point here is not that the pilot's consciousness is not ready to perceive something new but the fact

that he does not see ways for practical application of the advice and recommendations stated in materials on these problems. In addition, pilots greet some recommendations with skepticism, since sometimes (as experience indicates) an attempt is made to incorporate them into the training process, and thus for all practical purposes taking time away from accomplishing more important tasks.

Why does this happen? Is it that matters pertaining to modeling are far from practical flight activities? Hardly. There are certain factors here which we feel should be given attention.

In our opinion one of the factors holding back employment of modeling in tactics is an attempt to utilize recommended forms and methods where there are no tactics. Tactics is a component part of the art of warfare, which encompasses theory and practice of preparing for and conducting combat. And since combat is an armed encounter between two opposing sides, without an adversary there is no engagement, and consequently there are no tactics. Modeling tactics without taking the adversary into account means deliberately carrying oneself away into that area which the adversary does not intend to invade. That is, as chess players put it, it is playing with oneself. History as well as combat experience attest that as soon as an armed adversary played the role of an "object" with which one was to meet face to face, the method of modeling immediately took on a real force. This was also the case during the Great Patriotic war. We shall cite some examples.

Three times Hero of the Soviet Union Mar Avn A. I. Pokryshkin writes: "Training drills were regularly conducted with young pilots. They would study the design features and armament of enemy aircraft and fascist air tactics. Then, using aircraft models, they would run through different variations of aerial engagements and would work on the most advantageous maneuvers and modes of attack." What does playing out an engagement mean? It means creating and examining a model of an engagement in a simple and easily understandable form. Using the language of cybernetics, it means constructing a functional model which represents an object's behavior. We emphasize, however: not only one's own behavior, but also that of the adversary, which must be forecast (predicted) and must be represented close to reality.

Here is the opinion on this matter by twice Hero of the Soviet Union Mar Avn A. N. Yefimov, stated in his book "Nad Polem Boya" [Over the Battlefield]: "...It is essential constantly to study the enemy, promptly to figure out his plans and anticipate his actions.... But at the time there was still firmly held by some of our comrades the opinion that it is not possible to analyze and memorize the possible variations of an engagement and all its elements, unique in their diversity. I shall state quite frankly that these comrades were in error... At first, for example, they laughed at our flight, because we went everywhere together, studied hard, and endeavored to coordinate our actions over the target. They even began calling us academicians in jest. But when the pilots of our flight began returning home without losses time after time, at postmission critiques the commanding officer began praising us with increasing frequency for our excellent combat precision and thorough preparations for sorties."

Also noteworthy is a statement by Hero of the Soviet Union Lt Gen Avn V. F. Golubev: "Having reached the center of the airfield, I executed a sharp left chandelle with a maximum load factor in order to reverse course. When I completed the maneuver, I was well above the adversary. He was not expecting such a maneuver and was dead ahead. Within a second and a half it was all over. Three streams of fire pierced the thin skin of the Messerschmitt, which flashed past about 5 meters below.

"This was a situation where dozens of variations and calculations for such a maneuver came in handy!"

The citations quoted here contain a remarkable feature: our famed air aces most frequently had ready engagement variations in hand, models of tactics and combat maneuvers, which they successfully employed in the air. Many of these variations took the enemy by surprise, since they worked on his weaknesses and made it more difficult to choose tactical response moves (they anticipated his actions). At the same time new tactics were born right in combat, since in the air unforeseen situations frequently arose, situations which required nonstandard actions. Tactical discoveries, however, were always made on the foundation of amassed experience. The concept of a model is multifaceted, and therefore a ready combat variation which was played out in the air can be called today with complete justification a full-scale model, that is, a model with which an experiment was conducted. Thus the practical aspect and value of modeling have been proven in battle.

Today's combat pilot is fully capable of evaluating his tactical resources, the ready variations (models) contained in these resources, and determining the attained level. This is one aspect of the matter. Another aspect is that it is important to elucidate for what many new definitions (model, algorithm, analogue, function, cycle, etc) are being utilized at the present time, for up to the present time they have also fully managed with the old ones. But the point here is that mathematical models of combat already exist (although they do not encompass the entire diversity of combat). They are constructed with the aid of analog computers, which better "understand" such a language, which more precisely reflects the processes which are occurring. This language must also gradually be mastered by the pilot, graduate of a higher educational institution, in order correctly to formulate a problem to the computer, to program a question put to it. A conclusion suggests itself from the above: if the adversary is excluded from the modeling process, there is no point whatsoever in applying this method in tactics; if one approaches modern tactics in a serious manner, modeling method is indispensable (just as it was indispensable to pilots in the last war).

The necessity of taking into account not a static but a functioning adversary in a model variant being devised also serves as an inhibiting factor in mastering simulation method. And we are talking about an adversary who operates not in a random way but in his own manner, that is, employing methods developed taking into account the strong and weak points of his equipment and tactics which are most appropriate for the prevailing conditions of waging combat operations. We shall recall that A. I. Pokryshkin's men studied the design features and armament of the enemy's aircraft as well as his tactics; A. N. Yefimov's men

devised countertactics -- they responded to a studied enemy tactic with their own, more effective tactics. V. F. Golubev, prior to shooting down a Messerschmitt with an old "Ishachka," carefully studied the habits of the Hitlerite "hunters" and their favorite devices.

Chief Mar Avn A. A. Novikov described preparation of another variation, based on analysis of the enemy's actions. The fascists frequently employed the following device when flying standard air patrol: one pair of Messerschmitts would search for enemy aircraft, while a second pair would remain hidden above cloud cover. Upon spotting Soviet fighters, the first pair would draw them into the cloud cover, while the second pair stood ready to attack after they came out on top or in breaks in the clouds. Pilot Pilyutov devised the following plan: to attack the enemy continuously in short bursts of offensive action, diverting and keeping him busy, withdrawing into cloud cover upon response attacks, steadily drawing the enemy toward the Soviet antiaircraft artillery engagement zone. The pilot, taking concealment under the cloud bases, closed on the Messerschmitts undetected, attacked and set one aflame. A minute later, however, he was attacked by the three other enemy aircraft. Pilyutov coolly maintained his tactics: he could have broken away from the pursuit, but then his stratagem would not have worked. He deliberately eased off on the throttle, proceeding in the direction of friendly antiaircraft guns, and when the Hitlerites came within artillery range, dove into the clouds. The ploy was close to completion, but the Messerschmitts were suddenly attacked by a trio of MiG-3s from another airfield before they reached the designated point of antiaircraft fire, and they broke off pursuit.

We shall note that in a situation close to critical, the pilot did not lose his composure. He was confident that events would develop precisely as he had projected, in spite of the enemy's clear numerical superiority. Tactical superiority -- a result of employment of a thoroughly prepared tactical plan -- was on his side.

Modeling of tactics in the course of military operations, resulting in adoption of that device (combat maneuver) which was most suitable (optimal) in given conditions, thus was directly linked with a pilot's psychological training, which gave him confidence and faith in success even with an unequal correlation of forces.

In connection with this it is also appropriate to bear in mind the air combat experience of North Vietnamese pilots against a numerically superior and more powerfully armed adversary. At the first stage of U.S. aggression against the DRV, a tactical variant was devised and employed which called for MiG-17 fighters to attack from ambush on the ground and in the air. In the course of training they would determine routes, flight altitudes, formations employed by the Phantoms, blind spots, and the points at which attacking formations would open up. As a result they obtained a dynamic model of the adversary usable for investigation. After studying it, flights of MiGs began surreptitiously redeploying to forward airfields which had been damaged by bombing strikes. They would land on taxiways which were still intact. At the designated time the MiGs would take off from the taxiways, close on the adversary undetected, hugging the treetops, and suddenly attack from close range. They would engage before the Phantoms reached the point at which they would open up from close formation (for initiating target runs).

We have deliberately employed the expression "model of the adversary" here. We have been dealing with a certain generalized model, reflecting general features which are the most characteristic of U.S air tactics. One can readily find a like analog from the experience of the Great Patriotic War.

At the final stage the standard model of enemy fighter actions against our ground-attack aircraft was as follows. Aircraft of two types -- Me-109 and FW-190 -- working in coordination with one another, would form a single group. Employing an altitude-stacked formation, Me-109s would form the top tier, attempting to engage our cover fighters and draw them away from the strike group of Il-2s. Focke-Wulfs, making up the lower tier, at this moment were attempting to penetrate through to the ground-attack aircraft. They rarely employed head-on attacks, usually making their attack passes from the rear quarter, from an exposed direction, often skimming the trees, camouflaged against the terrain background. The details might vary, but the overall pattern remained constant for a fairly extended period of time. Aware of this fact, our pilots would correctly deploy their forces, designating Yak-3 and La-5 fighters to engage the Messerschmitts and Focke-Wulfs, and devising standard tactics to repel attacks, taking into account the combat characteristics of the Soviet aircraft.

The cited combat variations did not arise spontaneously. The most advantageous variant was chosen from several possible ones, that one which most fully took into account the weaknesses of the enemy's equipment and tactics. We recall the diagram-festooned dugout of A. Pokryshkin and the fat notebook of I. Kozhedub, filled with marks decipherable to him alone (today these marks would be rightly called symbol models). All this indicates that time and paper were being expended usefully, in the interests of increasing fighting skills, for the purpose of amassing valuable experience. "When you know your adversary, it is easier to defeat him in battle" -- this inspired phrase by three times Hero of the Soviet Union A. I. Pokryshkin perfectly summarizes the above.

There is one more inhibiting factor on the road to universal utilization of simulation and modeling -- totally unwarranted attempts to work out models which are already available. Resources are expended unproductively on this, and the advantages of the modern method of military-scientific cognition are placed in question. Modeling is an innovative process. It presupposes obtaining new information on the original by examining it on an analog -- a simplified model. By rewriting the content of a drill or redrawing a diagram from a methods manual, the pilot is not modeling but is merely making a copy, for a drill or exercise is a ready, air-tested model. But the main thing is that his work lacks true inquiry and statement of something new. This quite naturally evokes dissatisfaction and inner resistance. At the same time many tactical drills or exercises, at which simulation of the enemy is assumed, give the pilot and commander free choice of devices. The attained level of preparation permits them to display initiative. But frequently the "enemy" either plays along or constructs his scheme in full conformity with the plan of the opposing side, since he is unable to do otherwise. The result is competition in flying skill and GCI practice. A battle of intellects, so essential for development of tactical thinking, is lacking. Here one can state quite definitely: before employing (or rejecting) simulation or modeling, one must have a clear understanding of its objectives.

Another question must be answered: why has the need for simulation and modeling in tactics become so critical today? Let us return to the example of the synthesized model of the adversary (incidentally, the expression "synthesized model" was not thought up by us, but was taken from the well-known book "Prognozirovaniye v Voyennom Dele" [Prediction in Military Affairs], where it is defined as manuals, regulations, and principles of art of warfare. Therefore Pokryshkin's formula "Altitude-Speed-Maneuver-Fire" can with full justification be called a synthesized model of aerial combat). When the combat variation against Me-109 and FW-190 fighters was devised, in a formation stacked two or three high the aircrews retained visual contact. The commander controlled his subordinates in the air, keeping them under his observation.

Subsequently, as experience indicates, the combat formation opened up, which led to loss of visual contact between groups of differing tactical designation. This by no means, however, repudiates continuous tactical coordination between them. Throughout the entire mission each group's leader should mentally picture not only the position of adjacent groups but also their progression. It has become virtually impossible to meet this requirement without preliminary elaboration of one or several combat variations (or combat mission plan) and memorization of their basic elements. Hopes on receiving helpful instructions from the command post may be unexpectedly dashed, for example, if the adversary proceeds with intensive electronic jamming of the communications and control channel.

The following situation can also occur: in the course of aerial combat the adversary employs actions which are unexpected to the pilot and the ground control facility. This is what happened, for example, in a multiple-aircraft engagement when checking the weapon and tactical proficiency of a fighter subunit. The "aggressor" executed a turn in a direction different from that specified by the schedule. The pilots failed to notice this, while the combat control team on the ground was caught flat-footed. A combat variant which would provide for such actions by the "aggressor" would have come in handy at this point. Change in the character of the engagement should have been modeled, with a situation prediction. But this was not done, and therefore it was necessary to terminate the engagement, and the trainees had to settle for a poor mark.

One can conclude from the above that simulation and modeling in tactics as a method of forecasting and scientific prediction is becoming a principal device in preparing a pilot for a new, complex combat mission situation. Victory over a technically and tactically well-prepared adversary can be gained only by that pilot or commander who is thoroughly familiar with the capabilities of his aircraft and weapons, who possesses a flawless mastery of them, who possesses excellent familiarity with the enemy, and who is able in any and all situations to place against the adversary his own moral-psychological foundation, his own school of aircraft handling, weapons employment, operational art and tactics.

3024
CSO: 9144/0035

CADETS URGED TO COMPLETE THEIR SCHOOLING

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9, Sep 83 (signed to press 1 Aug 83) p 36

[Article, published under the heading "On Topics of Ethics," by Lt Col A. Finayev: "Do Not Betray the Dream"]

[Text] I met him in the training regiment of the Kacha Order of Lenin and Red Banner Higher Military Pilots' School imeni A. F. Myasnikov. Pilot cadet Sergey Slizkiy was copying some papers. He was copying papers at a time when intensive flight operations were in progress at the airfield. It was strange to see him not out at the field but in the office.

"Why aren't you out flying?" I inquired.

"I've done my flying!"

What had happened? At first I thought that the officer candidate, by reason of his youth, had committed a serious infraction. Or perhaps he had been grounded for medical reasons? But it was something else altogether. The council at the Kacha School had decided to dismiss cadet S. Slizkiy from the school because of his disinclination to continue his studies.

Taking up my pen, I would like to address not only him but also many others his own age who have chosen as their life's goal conquest of the expanses of the fifth ocean: do not betray your dream!

Sergey claimed that he had erred in choice of career. Is this really so? It became clear from our talk and conversations with his fellow cadets that he had chosen his career consciously and entirely correctly. The lad had dreamed of flying since his 7th year in school. He had avidly read books about aviation and had gone to movies about fliers. He had happened to meet a fine, kindly individual -- military training officer Capt (Res) Rustam Gaganfarovich Aliyev. He wanted very much for Sergey to follow his example and become an officer. This was not dimple propaganda, as Sergey later claimed, but something else. The people in whom he was in contact inspired him with their personal example of service to the homeland, while not concealing the burdens of military service.

Slizkiy did not experience any serious difficulties in his training. His potential and abilities were given high marks by his teachers and flight instructors. Take, for example, the pilot evaluation made by his instructor. It contains the following: "He fully completed ground-school training, with good performance results. In dual flight training he experienced slight difficulties in setting up his landing approach. Flying technique good. He performs intelligently and with composure in a difficult situation.... Acquired flying technique skills solid."

What can one say? If everything is progressing well, if you and the skies are made for each other, it would seem that herein lies the meaning of flying. At first everything was developing for Sergey precisely in this manner.

And then instead of joy and pride in his chosen career -- unwillingness to continue his studies after spending two years at the school. This did not occur suddenly, but developed gradually, as the training program became increasingly difficult and as commanders became increasingly demanding on quality of student performance. The very first difficulties made Slizkiy, who was unaccustomed to long, hard labor, unsure of his ability and engendered doubts. He was attracted to aviation by the romance of flying, by that profound respect which is deservedly enjoyed among the people by those of the flying profession, but soon he saw that it was no simple matter to be a military pilot. He was not troubled by the fact that he was betraying his dream and damaging his own life. His conscience also remained silent for, quite frankly, Slizkiy had taken away the dream of flying from one of the young men who had applied for enrollment at the same time he did but who had not been accepted through the competitive examination process, or at the very least he had postponed that dream for a certain period of time. Nor would it have hurt to consider how much money the state had spent on his schooling during those two years. He should total it up. It makes an impressive figure!

Slizkiy told me that he now had a different view of things, that he had changed his convictions. But had he really had any convictions? After all, if a person is easily swayed by mood and various influences in his actions and in determining matters of importance in his life, what kind of firmness of convictions can he have? Nor would Sergey listen to the good advice of his comrades or consider the opinion of the group. Officer candidate S. Bokarev was a friend of his. Quite frankly, this individual deserves respect. Bokarev indeed has firm convictions. He chose his path in life once and for all and is confidently advancing toward his stated goal. For example, he resolved together with other officer candidates to earn the right to fly a training mission in the stead of former Kacha pilot Hero of the Soviet Union Timur Frunze. And he had succeeded, earning that coveted privilege. Bokarev was bitterly disappointed in his friend when he learned of his decision. He tried to stop Sergey, to explain to him the rashness of the step he was taking: "You are making a mistake in leaving school. You are doing harm not only to yourself but to the school as well. Think about it before it is too late; are you not just fooling yourself?"

His comrade spoke the truth. It was particularly obvious to others that Sergey was doing the wrong thing. Conduct of this kind is called an ailment of youth:

Continuing their work on improving the long-range bomber, in the spring of 1939 OKB [Experimental Design Office] specialists submitted for flight testing a new version of this aircraft -- the DB-3F. In 1940, under the designation Il-4, it replaced the DB-3 and became the principal long-range bomber of the Soviet Air Forces in the Great Patriotic War. Successful bombing raids on targets far behind enemy lines attested to the high degree of combat effectiveness of the Il-4. Production was steadily increasing, and they totalled 5,256 units by the time it was retired from production (1945).

By the middle of the 1930's OKB had proceeded with development of a special battlefield aircraft -- an armored ground-attack aircraft or, in other words, a "flying tank." Repeated attempts to develop a ground-attack aircraft were undertaken in the prewar years both in this country and abroad. At that time it was extremely difficult to build a ground-attack aircraft possessing excellent performance characteristics, a high degree of combat effectiveness and survivability. It was necessary to solve a number of complex problems connected with design, engineering, and setting up production. The OKB staff accomplished these tasks. The result was the Il-2, a formidable combat aircraft, which played an outstanding role in the Great Patriotic War. Development of a new branch of aviation signaled the beginning of new combat tactics. Chief designer A. S. Yakovlev stated the following: "Essentially ground-attack aviation as a new air branch which works in close coordination with ground forces was established on the foundation of aircraft designed by S. V. Il'yushin."

The Il-2 was the most numerous aircraft in our Air Forces during the war: a total of more than 36,000 were built. Up to 50 aircraft came off the production line each day. This is truly a record in the aircraft industry, a record which has never been beaten!

Experience in designing and combat employment of the Il-2 was extensively utilized in developing the high-speed, highly-maneuverable Il-10 ground-attack aircraft. It was considerably superior to the Il-2 in performance characteristics and approached those of fighters.

At the same time S. V. Il'yushin was continuing to work persistently on improving long-range bombers. In order to test the possibility of powering aircraft with diesel engines operating on heavy fuel, an experimental model of a new long-range bomber, the Il-6, powered by two diesel engines, was tested in 1943. It was somewhat larger than the Il-4 and displayed excellent performance characteristics.

At the end of the war the OKB proceeded to design jet-propelled bombers. An experimental four-engine jet-propelled bomber, the Il-22 -- the first jet aircraft of this type in the USSR -- commenced flight testing in July 1947. This aircraft was used to study new problems facing jet aviation and to test new engineering concepts. The engines on this aircraft were mounted on underwing pylons. This engine mounting arrangement was used by the OKB at an earlier date than similar designs employed abroad.

Later the people at the OKB designed in a short period of time our country's first jet-propelled tactical bomber, the Il-28. Its flight tests, which

commenced in the summer of 1948, revealed the aircraft's excellent performance characteristics, ease of handling, stability, and maneuverability. The Il-28 was fast, simple to fly, and could take off from and land on dirt strips. The Il-28 was the first aircraft to incorporate a new method of assembly, which ensured high precision in producing the aircraft's lines, especially the wing, and reduced production labor requirements. There were several modifications of the Il-28. This aircraft, minus armament, was employed by Aeroflot to haul mail and cargo on a number of routes, which helped successfully prepare for operating the jet passenger aircraft which entered service in subsequent years.

Continuing to perfect the design of jet aircraft of this type, in 1949-1954 the OKB staff developed experimental jet combat aircraft: a swept-wing tactical bomber, a long-range bomber, and a transonic bomber with a 55° swept wing, which made it possible to design a maximum speed close to the sound barrier. At the same time experimental-design projects were in progress to develop an armored ground-attack aircraft powered by two jet engines. These aircraft were successfully flight-tested, in the course of which the designed performance characteristics were confirmed.

The war was still in progress, but a new area had already begun to develop in the design staff's creative activities -- development of aircraft for civil aviation, which in time became one of the staff's principal occupations. The party Central Committee and Soviet Government assigned the OKB the task of developing a passenger aircraft with performance characteristics surpassing the level achieved abroad.

At the time there existed two views on building aircraft intended for carrying passengers. Some experts considered it possible to adapt bombers for this task, creating the requisite passenger comfort in a new fuselage. Others insisted on the need for an aircraft of a special type, capable of transporting passengers as inexpensively as possible, utilizing the latest advances in science and technology, with an economics approach to all aspects of engineering design. Precisely this was the position taken by our OKB.

The 27-passenger Il-12 commenced flight testing in August 1945. Flight tests confirmed the high marks given to the new aircraft by the test pilots. The decision to put it into regular production was made even before the commencement of government acceptance tests. The Il-12 began regular passenger service in the summer of 1947, and several months later this aircraft was in international service and was being extensively used in arctic operations. The Il-12 continued in regular production up to 1949. A total of 663 of these aircraft were built.

Development of the first passenger-carrying Il'yushin signaled the beginning of establishment of a new directional thrust in the development of Soviet aviation, characterized by efforts to achieve highly economical operation, aerodynamic sophistication and maximum weight efficiency, safety and reliability, and comfort for passengers and crew.

Securement of a high degree of safety was determined both by design engineers and by the design solutions. It was achieved by proper choice of number of engines and suitable power-to-weight ratio, aircraft aerodynamic layout and

time passes, and a person, having gained life experience, suddenly realizes that he had done a foolish thing. But sometimes it is too late to correct his mistake. One does not need to go far for examples. They are right here, at the school.

Perhaps Sergey had heard about cadet Vladimir Yatmanov, formerly enrolled at the Kacha school. He was terminated in the third year. Prior to that his superiors had made every effort to convince the lad that his place was at the school, but he had insisted. He motivated his decision by stating that his mother was frequently ill and that, if he were nearby, he could help her. In actual fact Vladimir brought her only grief. And he had betrayed his dream.

A year went by. Yatmanov finally realized that he had acted rashly. At this point his mother was forced to petition on his behalf. Unfortunately, however, it was too late.

Yes, one must answer for every action in one's life. Does Sergey understand this fact? He was enthusiastically planning on entering a university after completing his military service, followed by graduate school. But is he sure that he will achieve his goal, that he will not once again bail out upon encountering difficulties? After all, attainment of any goal in life is first and foremost hard, persisting work. Sergey was told this not only by his superiors, his comrades, but also by his parents. His father, Dmitriy Fedorovich, and his mother, Lyudmila Aleksandrovna, made every effort, coming to the school to try to convince him to continue his studies. Life experience had undoubtedly suggested to them that their son had not yet become a fully mature adult, and therefore had not yet acquired his place in life.

We should also stress the following. How could it happen that party and Komsomol activists did not in fact know their comrade and were unable to influence him and form correct convictions in him? Perhaps they were lulled by Slizkiy's activeness at the commencement of his military service. After all, he was a member of the Komsomol Bureau, editor of a wall newspaper, a category-rated athlete, and had on numerous occasions defended the subunit's honor in competitions. Now they have received an object lesson: not a single individual should be allowed to get out from under their influence, no matter how good he appears to be at first glance; one should thoughtfully conduct individual indoctrination work with each person, one should be aware of people's moods and attitudes, and one should prevent misdeeds.

As is evident, not everything has yet been done at the Kacha school to instill in the cadets a love of their romantic, interesting, fascinating profession of military pilot. Not all forms and methods of instilling in the future combat pilots pride in the profession have been utilized. And if even one individual has betrayed his dream, this constitutes a slipup in the performance of the entire collective.

3024
CSO: 9144/0035

BRIEF HISTORY OF ILYUSHIN DESIGN OFFICE

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9, Sep 83 (signed to press 1 Aug 83) pp 37-39

[Article, published under the heading "Science Serving the Homeland," by Hero of Socialist Labor V. Borog, Experimental Design Office chief designer, recipient of USSR Lenin and State Prizes; and I. Vasin, Experimental Design Office senior designer: "How the 'Ils' Were Created"]

[Text] It is the 50th anniversary of the thrice-decorated Experimental Design Office bearing the name of eminent Soviet aircraft designer Sergey Vladimirovich Il'yushin. Established in 1933, from the very outset it adhered to a number of fundamental principles of aircraft design formulated by Il'yushin: achievement of maximum combat or commercial effectiveness, a high degree of reliability and safety, ease of manufacture and simplicity of all design engineering solutions, ensuring reliable manufacture, operation and maintenance. His activities were directed chiefly toward designing bombers and armored ground-attack aircraft for the Air Forces, as well as development of passenger aircraft and cargo transports.

The very first aircraft produced by the young design office gained widespread recognition and fame. For example, by 1935 the Experimental Design Office had designed, built, and tested the TsKB - 26 twin-engine, long-range high-speed bomber. Its further refinement led to the development of the TsKB-30 (DB-3) and Il-4 aircraft. The TsKB-26 displayed excellent performance characteristics for the time. It was distinguished by excellent stability and controllability and could continue flying with one engine out. Its maneuver characteristics surpassed the requirements placed on such aircraft.

As we know, test pilot V. K. Kokkinaki, who has since twice been awarded the title Hero of the Soviet Union, flying a TsKB-26, flew for the first time in the USSR an inside loop with a two-engine aircraft. On 17 July 1936 he set the first world record officially recorded by the International Aviation Sports Organization (FAI). In 1938-1939, flying the modified TsKB-30 "Moskva," intrepid Soviet pilots made two long flights from Moscow to the Far East and to North America. This was an outstanding achievement, which confirmed the correctness of the design decisions made in developing long-range bomber aircraft as well. The foundation of long-range bomber aviation was laid by the end of the 1930's with various modifications of DB-3 aircraft.

arrangement of controls, by designing an airframe with enhanced survivability, and by reliability of all powerplant systems and equipment.

Flight testing of the Il-18 aircraft, powered by 4 piston engines, commenced in the summer of 1946. It was designed to carry 60-65 passengers distances up to 5,000 kilometers and was intended to augment the fleet of Li-2 and Il-12 aircraft which were operating in short and medium-route service. The new aircraft displayed good performance characteristics. But the first version was not put into regular production. At the time it was believed that Aeroflot did not need large passenger aircraft.

The Il-14 occupies an honorable place in the family of Il'yushin passenger aircraft. Flight testing began in October 1950. The Il-14 seemed to be identical in design to the Il-12, but its shapes and aerodynamic layout of the wing and tail assembly were different, and its fuselage was longer. This made it possible to increase the number of passengers carried. This aircraft went through extended, comprehensive operational tests in the harsh conditions of Yakutia and Krasnoyarsk Kray, as well as at high-elevation mountain airfields. It met the most stringent requirements. This aircraft was the first in the USSR on which comprehensive tests were conducted on takeoff with one engine out, as well as control capabilities in critical flight configurations. After this they became the nucleus of the flight testing program for all Soviet multiengine passenger aircraft.

The Il-14 began regular service in November 1954. The large-scale utilization of these aircraft over a period of many years, on Aeroflot domestic and international routes, as well as employment by the airlines of many other countries, and their extensive utilization by Soviet scientific expeditions at the North and South Poles confirmed the excellent design and construction features of this aircraft and its outstanding performance characteristics. It remained in regular production up to 1957. A total of 839 aircraft were built.

The appearance of Soviet turboprop engines signaled the beginning of development of gas-turbine passenger aircraft. Turboprop engines were more economical than turbojets, which was a very important factor in designing economical passenger aircraft. They made it possible to fly at greater speeds than piston engines.

In 1956 the OKB staff commenced development of a new version of the Il-18 aircraft. It was equal in level of technical sophistication to the best foreign-built aircraft of its class. The Il -18 was designed to carry 14 tons of commercial cargo. The number of passenger seats could be varied across a broad range -- with a maximum of 110. Difficult problems of ensuring high fatigue strength and long service life with minimum weight expenditures were resolved in designing this aircraft. The aircraft successfully passed the test to meet ICAO standards and was awarded an international airworthiness certificate. It was awarded a gold medal at the Brussels World Fair in 1958.

These aircraft entered regular service in April 1959. Right up to the middle of the 1970's the Il-18 was the principal medium-range aircraft in major-route service not only in this country but abroad as well. More than 120 Il-18 aircraft were purchased by 17 different countries. It visited every continent.

The Il-18 flew regular service to Antarctica. Soviet pilots set 25 world records with this aircraft, many of which still stand. A monument was erected to the Il-18 at Sheremetyevo Airport in the spring of 1979; the aircraft is still in active service on Aeroflot routes. A total of 564 of these aircraft were built.

The first turbojet passenger aircraft designed by the people at the OKB was the Il-62 large intercontinental passenger jet. Testing began in 1963. This is a second-generation turbojet aircraft. It is fast and offers improved passenger comfort. It can carry up to 186 passengers.

Four turbofan engines designed by N. D. Kuznetsov are mounted at the rear of the fuselage. This positioning of the engines made it possible not only to improve passenger comfort but also to employ a more sophisticated wing. Considerable attention was devoted to ensuring flight safety. In the layout of the wing and the entire aircraft, the people at the OKB succeeded in incorporating excellent performance characteristics in combination with a high level of flight safety.

The Il-62 went into service on international routes, inaugurating service on a transatlantic route between Moscow and Montreal on 15 September 1967.

The Il-62 was modified in order further to improve the aircraft and extend its range. It was fitted with new, powerful and economical turbofan engines, fuel carrying capacity was increased, and it was equipped with improved avionics. The Il-62M is still in regular production. Several world records have been established with this aircraft. The flagships of Aeroflot -- the Il-62 and Il-62M -- are in long-distance passenger service on routes in this country and abroad. They are being successfully employed by Interflug (GDR), ČESA (Czechoslovakia), LOT (Poland), TAROM (Romania), and other airlines.

The Il-76 cargo carrier, designed at the OKB under the direction of Chief Designer G. V. Novoznilov, successor to S. V. Il'yushin, took its maiden flight on 25 March 1971, flown by test pilot E. I. Kuznetsov.

This was the world's first heavy jet cargo aircraft designed from the very outset to operate out of both paved and unpaved short fields.

The Il-76 meets the requirements presently imposed on cargo aircraft. It hauls large-size freight and various equipment weighing more than 40 tons. Ground standing time has been considerably reduced thanks to in-aircraft mechanization of cargo handling operations and utilization of containers and pallets, both international and Soviet models.

Experience indicates that in many cases the Il-76 is the most advantageous and at times the only possible means of hauling freight to remote and inaccessible areas of Siberia, the Arctic, etc. The aircraft delivers "door-to-door" freight, hauling standardized air-sea-rail-truck containers. This aircraft has set 27 world records in the categories of load hauling and speed, records officially registered by FAI.

The Il-86, the first Soviet wide-body aircraft, the principal distinctive feature of which is large passenger capacity, is a third-generation jet aircraft. The demands of high reliability and excellent flight safety placed on this aircraft dictated the employment of new design solutions in engineering it and multiple redundancy of vitally important systems. The large fuselage provides a capability to accommodate up to 350 passengers in its three cabins and to provide them with a high degree of comfort, which meets international standards. A new system of carrying passenger baggage was specially developed for the Il-86, according to the principle of "carry-on luggage plus containers." This system helps reduce aircraft turnaround time, which directly influences economy of operation, helps simplify airport passenger handling procedures, and helps increase the actual speed of air travel.

Employment of built-in boarding stairs, allowing passenger boarding and disembarking from each passenger cabin, has greatly expanded the aircraft's operating capabilities and, together with the incorporation of a third underfuselage main landing gear, provided the capability to operate this aircraft from airfields designed to take the Il-18, Tu-134, and Tu-154.

The Il-86 took its maiden flight on 22 December 1976. The aircraft was given all the required tests, on the basis of which the USSR State Aviation Register issued a permanent airworthiness certificate. This aircraft has been in regular operation since 26 December 1980 on Aeroflot's heaviest-traffic domestic and international routes.

The successful job done by the people at the OKB was helped by close, productive relations with aircraft industry scientific research centers -- the Central Institute of Aerohydrodynamics imeni N. Ye. Zhukovskiy, the Central Scientific Research Institute of Aircraft Engines imeni P. I. Baranov, the Scientific Research Institute of Aviation Technology, the All-Union Scientific Research Institute of Aviation Materials Science, and others -- production plants, and clients.

The Il'yushin staff, presently headed by Chief Aircraft Designer G. V. Novozhilov, is working on large and complex tasks specified at the 26th CPSU Congress. The "Basic Directions of Economic and Social Development of the USSR in 1981-1985 and in the Period up to 1990" state: "Implement measures to achieve a substantial decrease in specific fuel consumption by efficient operation of aircraft, by reducing fuel losses, and by improving engine economy, weight and aerodynamic characteristics of fixed-wing and rotary-wing aircraft." This is indeed a fighting program for those people who are designing and building aircraft which meet the highest demands of the time.

1024
CSO: 8144/0615

BEREZOVOY REMINISCES ABOUT SOYUZ-SALYUT MISSION

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9, Sep 83 (signed to press 1 Aug 83) pp 44-45

[Article, published under the heading "Reminiscences of a Space Flight," by USSR Pilot-Cosmonaut Hero of the Soviet Union Col A. Berezovoy: "211 Days in Orbit"; concluding part of 3-part article (see Nos 7, 8)]

[Text] "Vacuum Cleaners" in Space

While in orbit we investigated various sources of X-ray and ultraviolet emissions. Interest in these ultrahigh-energy emissions first arose at the end of the 1930's, when the hypothesis was stated that X-radiation is born in so-called neutron stars. Such a star consists entirely of closely "packed" neutrons. An enormous mass, equal to or greater than that of the Sun, is compressed by gravity forces into a tiny ball 8-10 kilometers in diameter.

Neutron stars are the first and to date the only known objects in the universe consisting of atomic nuclei alone. The powerful gravitational field of such a star acts like a vacuum cleaner. If there is a normal star within its gravitational attraction, matter begins to be drawn from it. The neutron star's magnetic field shapes the drawn-off stream of gas into a jet which strikes its surface in the area of the poles. Kinetic energy, changing into thermal energy, generates X-radiation.

We devoted approximately 50 hours to astrophysical observations in the X-ray band with the aid of the RT-4M telescope. We took more than 1,000 images of the stars. Some neutron stars emit radio-frequency pulses with a repetition frequency as precise as the finest chronometers. These space clocks were first discovered in the summer of 1967 by Englishman E. (Kh'yunsh). The results were kept secret at first, but a year later they were made public. A new concept was born in astrophysics -- pulsars.

In the opinion of scientists, pulsars are rapidly-spinning neutron stars. The areas where the flow of cosmic matter impacts come in and out of the observer's view. In addition to regular emissions, pulsars emit rare powerful bursts of radiation. Within a period of several seconds intensity can increase 10-30-fold. The burst repeats several hours later.

What is the nature of these bursts? It is believed that the matter impacting on the surface of a neutron star spreads over the surface, as it were. Rich in hydrogen, it burns evenly and slowly, turning into helium which accumulates to a critical mass, at which a nuclear synthesis reaction takes place. The temperature rises abruptly. Consumed within tenths of a second, the helium generates an X-ray burst. Then the entire process repeats. More than 30 such regular-burst neutron stars have been discovered to date.

Objects called "black holes" are even more powerful "vacuum cleaners." Why have they been given such a strange name? Like a gigantic funnel, a "black hole" sucks in matter from the space around it. Entering the mouth of the funnel, the gas disappears, emitting no radiation. Hence the term "black." One can judge the strength of its gravitation from the following fact. A normal star located close by becomes its victim. The "black hole" draws matter from it. One such pair, Cygnus X-1, in the constellation Cygnus, is widely known to astronomers.

"But how are they discovered?" you ask. Think about it: when we pour water into a funnel we see a vortex flow form, in which the liquid disappears. A similar phenomenon occurs in space. Captured matter, gradually unwinding in a spiral path, takes on the form of a disk and slowly approaches the mouth of this funnel created by nature. During this time the matter heats up by friction to hundreds of millions of degrees, producing X-radiation. This is what gives away the presence of a "black hole."

Quasars, discovered in the 1960's, today appear to be even more "voracious." Scientists have calculated that to "feed" a quasar it must be "fed" each year approximately 20 Sun-size stars.

Ultrahigh-energy cosmic rays are of interest primarily to representatives of two sciences -- astrophysics and physics of elementary particles. The fact is that on the one hand the source of this radiation may be such to date inadequately studied cosmic objects as pulsars, expanding gas shells of supernovas, "black holes," active galactic nuclei and quasars, and therefore information obtained from their emissions is very important. On the other hand this radiation consists of particles of the highest energies known to man, thousands and millions of times greater than those obtained in earthbound accelerators. This is why study of such particles is of importance for specialists in high-energy physics.

Flight and Psychology

Valentin and I began training together a year before the mission. By that time he had already twice gone through a course of training and preparation for extended missions. But by blind chance he had not yet flown a mission: on the eve of his scheduled mission he had hurt his knee while practicing on the trampoline, and Valeriy Ryumin took his place on the 185-day mission. When our crew was put together, I was naturally glad to be with a person with thorough knowledge of the equipment, experienced in space work. I liked Valentin's engineer's intuition, his persistence, his demandingness on himself and others, and his open, honest character.

During our training we set a goal for ourselves: to discover those "sunken reefs" which we might encounter in orbit. The Salyut-7 station is packed with equipment. Each instrument, system, and experiment must be studied thoroughly. Naturally there were some psychological difficulties. We are no longer young boys; each has his own convictions, habits, and work style. And sometimes they do not match. But we quickly found a common tongue. We agreed at the outset that we should be completely frank with one another. By the time the mission began we probably knew one another as well as we knew ourselves, and we could objectively assess our strengths and weaknesses. I had become more demanding on myself and on others. When in the course of training we would encounter something in the documentation or methodology which had not been completely thought out, we would forcefully insist that the problem be corrected immediately. I remember that some of my comrades began to take offense at me for my allegedly excessive faultfinding. But I had learned that being an all-forgiving "good fellow" only hinders things. I was also constantly concerned by the thought that we would be performing for the first time many operations contained in the mission program. If any deviations from normal occurred, it would be necessary quickly to analyze the situation and reach a correct decision. Space is a stern judge. This is one feature of the cosmonaut's profession: he prepares for any and all situations, although many times they are not encountered on an actual mission.

Popov, Ryumin, and others of our comrades who had been on extended manned missions told us how difficult it was for two people to remain on board a space station for an extended period of time. Sometimes even critical situations arise. How can one avoid a crisis in interpersonal relations in such cases? Constant busyness, work helped. I was convinced that patience and a sincere endeavor to understand one's companion frequently ease a situation.

Valentin and I went through brief and very intensive joint training. For this reason we simply were unable fully to resolve certain matters pertaining to interpersonal relations. We had to address these matters in space. Of course it would be better for our successors to do otherwise. And one other thing. It would be advisable to make up crews so that the strengths of each supplement one another, while their weaknesses are balanced. This will result in a strong crew, capable of going further than we were.

On a long mission one must be infinitely patient: one must preserve the proper tone in communications with mission control and in relations with one's comrades. One feature of our profession is the fact that one is in full view at all times. We would talk with the specialists at mission control and sometimes forget that dozens of others are listening in. One of these persons does not fully understand the conversation, hears only the tone, and gets the wrong impression, that the cosmonauts are irritable and causing problems. In actual fact this of course is not the case. The conversation dealt with mission business, and different intonations are possible thereby.

A crew performs the most diversified tasks during a mission, with a great many ends coming together. And if something suddenly fails to operate properly, it is very easy simply to say: it is not my fault. Of course nobody is going to put the blame on you, and you are not to blame. It is simpler to blame

circumstances. But one is constantly gnawed by the thought: what will you bring back to earth, how will you look others in the eye if you have been less demanding on yourself? Some experiments are prepared by an entire team. If you do something wrong, entire years of labor are wasted. This is why at times we would work at full tilt 14-16 hours a day, totally exhausting ourselves. The strictest discipline, and one cannot relax. If you miss a single command -- an entire project, both your work and that of others, can go for naught. On the Earth you frequently do not see the end result of your labor: this relationship is concealed, hidden. In this case everything depends on your conscience. In space both your work and your conscience are in full view of everybody; you can't hide behind others.

The mission taught me to have a great deal of understanding for the individual peculiarities of my partner and to be tougher on myself. I believe that from a purely human standpoint the mission gave me a great deal for the future. It was difficult, of course: I missed my loved ones, missed everything terrestrial, even the accustomed hustle and bustle. We had various tapes of concerts and light music. By the end of the mission, however, we were more and more frequently playing Russian songs. We also had recordings of sounds -- a thunderstorm, rain falling, and birds singing. We played these tapes more frequently than any of the others, and we never got bored by them. They were like recontacting Earth.

Return

We had spent 211 days in space. The time had come to bid Salyut farewell. It was not as joyful a time as I had imagined it would be. We had mixed emotions. On the one hand we were anxious to go home. On the other hand we felt a certain dissatisfaction: it seemed that we could have accomplished more on such a long mission. Yes, during these 7 months the station had become home to us. But... it was time to go!

Transferring into the Soyuz, we kept asking each other: have we forgotten anything? This is a far from idle question. Many years of labor by many people had come together on this station. And now each of them was waiting for his bit of information obtained by us.

We completed checking the seal on the docking assembly. We wrote on it: "This is not farewell!" We reported to Mission Control: "'Dawn'! We have separation! We are moving away from the station."

"Happy landings! We'll be waiting for you down here. Search and rescue services deployed and ready. Exact landing locality is being determined...."

Soon we heard the voice of the mission controller: "'Elbrus,' it is now night in the landing area, but the weather is good: wind to 6 meters per second, -15° Celsius, visibility 10 kilometers. Incidentally, the steppe is fairly soft in the landing area; they have just had a large snowfall. You should have a soft landing."

A night landing following an extended mission. This was due solely to technical limitations. The fact is that two conditions must be met in starting the deceleration burn: it must be in sunlight in order to verify spacecraft attitude, and the landing must not occur later than 1 hour before sunset, in order to facilitate finding and recovering the crew. Unfortunately these conditions did not coincide for us. As they say, we had to choose the lesser of two evils. Sunlight at burn initiation is more important. In addition, our search and recovery teams are experienced in recovering crews at night.

Everything was going well on board the spacecraft at this moment. The automatic system triggered, and the spacecraft went into a controlled descent trajectory.

We plunged into the atmosphere like a fireball. Crimson trails of plasma flamed past the viewport glass. The descending spacecraft was a fiery glow. Communications with the ground were interrupted.

We passed from sunlight into the Earth's shadow. We were accustomed to this. Throughout the entire mission we had greeted dawn and dusk 16 times each day. Now by force of habit we were expecting the bright sun to reemerge in the cloudless sky. But there was no sun. A snowstorm was raging in the pitch blackness of the Dzhezkazgan Steppe. The weather had brought us a surprise. Part of a warm air mass, contrary to the predictions of the meteorologists, had moved onto the open expanses of the steppe. The weather deteriorated: low overcast, fog, followed by snow, with crumbly, fluffy snowflakes.

I recall the interest with which we listened to helicopter pilot N. Karasev on the actions of his crew, the first to put their aircraft down by our spacecraft. I continue to have great admiration for his courage and flying skills! He repeatedly attempted to bring his craft down, but on each occasion became enveloped in a cloud of snow raised by the rotor blades. Even the landing lights did not help. Finally the leader of the search team gave him permission to use his own judgment in putting the helicopter down.

There were 10 persons on board the helicopter. Karasev realized that he was taking a risk, but nevertheless he took responsibility on himself and made the landing, because he knew that all 10, just as he, were extremely anxious to help us. He landed the helicopter like an airplane, with a short landing roll, as they say. Thus help arrived, and fairly quickly.

The search and recovery equipment, with doctors on board, also arrived at the landing site. They had proceeded cross-country across the steppe at night. They arrived and provided us with warmth and comfortable shelter for our first hours on Earth.

Many thanks to all those who met us and provided us with warmth on that dark, frosty night!

In the meantime the weather had deteriorated. It could not ruin our mood, however. It is difficult to convey in words how pleasant it is to be simply an earthling. And, in addition, surrounded by happy, smiling faces. You want to hug and kiss every one of them.

Naturally 211 days in a state of weightlessness have an effect on the human organism. Right after our return from space I had difficulty not only in walking and standing but even sitting. In the 7 months in space, some muscles had become disaccustomed to performing their normal terrestrial functions. We had to lie and rest before rising and beginning to move. Initially we spent a fair amount of time in the pool. It helped us get on our feet. On the third day we received permission to go to the mess hall, and by New Year's Day we were back home at Star City.

We are now enjoying the normal Earth routine, enjoying it, in order once again to yearn for working in space.

3024
CSO: 9144/0035

ISRAELI AIR TACTICS IN LEBANON ANALYZED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9, Sep 83 (signed to press 1 Aug 83) pp 46-47

[Article, published under the heading "Abroad," by Col V. Dubrov: "Aviation in the Lebanese Conflict"; first of two parts; based on materials published abroad]

[Text] The criminal attack by the Israeli military on Lebanon and the Palestinian refugee camps in June 1982 riveted the attention of all progressive mankind. Never before had the Zionist aggressors acted with such undisguised brazenness and cynicism. Israeli soldiers ground a peaceful country under their heel, carrying death and destruction into its towns and villages. Flouting the standards of international law and supported by their patrons and eggers-on in Washington, the leaders in Tel Aviv transformed the territory of a sovereign nation into a proving ground for testing U.S. weapons and new combat equipment, including aircraft. Air operations in this armed conflict aroused the interest of foreign military experts. The Israeli aggressors employed the new U.S.-built F-15 and F-16 fighters, as well as third-generation Sparrow and Sidewinder air-to-air guided missiles.

We believe that it would not be inappropriate to make a brief digression back to events which occurred 10 years earlier, recalling U.S. air aggression against the DRV.

As we know, Vietnam is bordered by sea on the east and stretches from north to south. This directly affected the character of U.S. air operations and organization of combat support. Fighter-bombers (and later strategic bombers as well) took off from airfields in Thailand in large groups, carrying hundreds of tons of bombs to the Hanoi-Haiphong area. Following them in a common formation were fighter escort groups. ECM aircraft stood by out at sea, beyond the range of antiaircraft fire, ready to jam air defense system radars; Air Force (EC-121) and Navy (E-2A) airborne command posts -- radar early warning aircraft -- were also positioned offshore. A fighter screen would move into the target area ahead of the main strike force, sealing the area off from possible penetration by North Vietnamese MiGs.

Now let us reconstruct for comparison the picture as it was 18 months ago in the Near East. The narrow territory of Lebanon adjoins the sea (only on the west) and stretches from south to north. Flights and squadrons of Israeli

fighter-bombers would take off from their bases and proceed northward toward Beirut. Already waiting for them there would be E-2C Hawkeye radar early warning aircraft, holding station off the coast. Groups of F-15 and F-16 fighters would be loitering somewhat closer to the coast; prior to arrival of the main strike force into the target area, these fighters would proceed eastward and form a multiple-tier screen.

Foreign observers note the striking similarity between these models. And this is quite understandable: the Israeli aggressors have someone from whom to take an example in developing tactics, from whom to borrow analogues of deployment and utilization of forces; they have someone from whom they can purchase the modern aircraft required on the basis of the conditions of conduct of warfare. One readily notes that all the aircraft mentioned above are of U.S. manufacture. Changes in tactics are minimal. They consist in elimination of the mode of direct escort of strike forces and employment of a single mobile screen consisting of F-15 and F-16 fighters.

A screen is nothing new as a mode of providing cover to air attack force. It is considered a variation of clearing airspace. In this instance fighters formed a barrier on probable avenues of approach by hostile aircraft. The strengths and weaknesses of a screen were revealed in the course of actual combat. Foreign experts consider as advantages the freedom of action fighters have after they are removed from a common formation with the bombers. They are not tied to the attacking force, and thus they can wage not only defensive but offensive combat as well (defensive combat is defined as repelling enemy attacks while maintaining position in the formation). The freed covering fighters work in coordination with the supported bombers only by timetable, without maintaining continuous visual or radar contact. They must move to intercept and engage enemy fighters, however, on command from their command post.

A weakness of the screen is the need to organize radar monitoring of the strike area and approaches to it throughout the entire period of the raid. As the events in the Near East have shown, this is no easy task, particularly when the area is located at considerable depth. Another weakness, which is less clearly marked, is the poorer reliability of the screen in comparison with direct escort of the bombers, as well as vulnerability of the "barrier" of fighters to fire from ground air defense weapons over hostile territory.

The Israeli command authorities sought to eliminate these weaknesses as follows. Continuous radar monitoring of the tactical area of operations was handled, following the U.S. model, by radar early warning aircraft, which also served as airborne command posts. E-2C Hawkeye aircraft maintained surveillance of airspace over Lebanon and controlled the movements of the screening fighters. The latter were made invulnerable to ground air defense fire by advance radar jamming by a Boeing 707 ECM aircraft (a passenger aircraft modified by Israeli industry). In addition, prior to engagement, the fighters stood by in zones located safely out of range of antiaircraft fire.

In order to ensure their safety, the Hawkeye airborne command posts were positioned further out to sea. This was in conformity with the official views of U.S. command authorities on positioning airborne command posts during combat operations. In this case considered factors included the fact that radar

early warning aircraft do not carry means of individual protection against fighters -- defensive weapons and airborne jammers; secondly, the surveillance radars carried by these aircraft are capable of detecting air targets at a distance of more than 300 kilometers in lower hemisphere surveillance mode. Therefore with a Hawkeye airborne command post on station 100 kilometers from the coast, it could maintain surveillance on the entirety of Lebanon and adjacent Syrian territory at all altitudes.

The deployment of forces prior to commencement of group air combat (dispositions) corresponded, in the opinion of foreign experts, to the combat capabilities of the new fighters and the nature of their assigned mission. It was almost identical throughout the entire period of combat operations: groups of F-15 and F-16 fighters, an airborne command post and ECM aircraft were placed in a composite formation. The latter two aircraft held position during combat, continuously maintaining station in their assigned zones.

The groups of F-16 aircraft, designated to fight close-quarter dogfights, were the most highly mobile part of the battle order. Aerodynamics, tactical and flying performance characteristics, as well as the armament carried by these light fighters were specifically tailored to this mission. The groups of F-15 aircraft, the principal mission of which was to monitor airspace in the TAO and to gain tactical superiority, were a less maneuverable segment of the force. Aircrews monitor airspace with the APG-63 airborne radar (air target detection range in the upper hemisphere more than 80 km), while the aircraft's performance characteristics and Sparrow AIM-7F medium-range (5-50 km) missiles are used to achieve air superiority.

Width of the dispositions was determined by the frontal spread of two to three fighter loiter zones, while depth was determined by the distance from the on-station position of the Hawkeye airborne command post (or Boeing 707 jammer aircraft) to Lebanon's eastern border. According to information in the foreign press, manned Israeli aircraft did not enter Syrian airspace. Flights by unmanned reconnaissance drones of various types formed an exception.

Prior to entering Lebanese territory by the Israeli strike groups (fighter-bombers and ground-attack aircraft), the airborne dispositions comprised a multiple-tiered arrangement positioned beyond the boundaries of the tactical area of operations. The light F-16 fighters were positioned in the lowest tier. Hawkeye airborne command posts and F-15 aircraft were positioned at the middle altitudes. The Boeing 707 ECM aircraft would be positioned higher (and further out to sea). The airborne command post usually had a close cover group, including a pair of F-15 fighters.

Each element of the force performed its own mission, but the actions of all were coordinated and subordinated to a common plan. Command and control, guidance, and exchange of information were accomplished by radio. Automatic command links existed only within the control system of the slow, unmanned Scout and Mastiff battlefield reconnaissance drones. Radio communications between airborne fighters were strictly limited; the air was kept maximally open for the airborne command post to control all aircraft and groups in or on the approaches to the tactical area of operations. "Blind" zones in the Hawkeye airborne command post radar surveillance created by Lebanon's mountain

topography, were covered by F-15 search radars, which detected air targets against a terrain background up to a range of about 50 km. For this purpose F-15s would be moved out of the loitering zones closer to the TAO.

In the search phase duties within a fighter pair would be distributed approximately as follows: one pilot would conduct search in the upper hemisphere, while the second, maintaining a lateral interval of up to 1,000 meters, would search the lower hemisphere (search sectors ±60°). The fighters themselves would be radar-monitored during this time by the airborne command post, which would warn them of an approaching threat.

Fighters would most frequently be engaged on Hawkeye command. The airborne team leader, positioned at the main screen (25.4 cm diameter), performed situation monitoring and analysis with the aid of an airborne computer system, which processed radar data input. The real-time information display enabled the operator to evaluate the possibilities of accomplishment of the combat mission assigned to the fighters. Specific symbols designated unidentified air targets, friendly fighters, as well as targets representing the greatest threat. After selecting a group for intercept (engagement), the computer would solve the target closing problem and display on the screen speed, altitude, and range to target. The operator would communicate this data to the commander of the group of fighters standing by. They would turn to the specified heading and search for the adversary as they closed.

The F-16 pairs, brought into action first, would descend to extremely low level during the approach phase, in order to evade hostile radar surveillance. If they entered sectors not under observation from the airborne command post, they would receive target designation from the F-15 aircrews. As foreign military experts note, this form of coordination between fighters was being employed for the first time. This was dictated by the necessity of maintaining continuous radar surveillance by every single deployed aircrew from the beginning to the end of group air combat. Before executing a target approach, a pilot would receive information on absence of attack threat by hostile fighters. When the mission execution conditions called for aircraft to approach at medium or high altitude, natural concealment was impossible. In this case concealment was achieved by means of active radio and radar jamming by a Boeing 707 or mobile ground stations set up on mountaintops.

The decision to engage F-15 fighters would be determined primarily by the possibility of employing medium-range weapons -- AIM-7F missiles. This weapon has a semiactive radar guidance system, and therefore it is sensitive to target maneuver. If the target refrains from maneuvering for at least a short time, its lock-on and tracking by airborne illumination radar as well as the missile's radar seeker are assured. A vigorous change in heading (large target angles) and altitude (usually an abrupt dive) can thwart lock-on. But close-quarters engagement remains a possibility, since on-board ordnance includes AIM-9L Sidewinder short-range missiles. This means giving up use of the principal advantages of the air-superiority fighter -- the medium-range attack. There is also an increased probability of being shot down. The F-15 fighter, which is crammed with complex electronics, is at least twice as expensive as the F-16 close-combat fighter, which is considered an important restraining factor.

It follows from the data characterizing the capabilities of the F-15's APG-63 radar that air target detection ranges in the upper hemisphere (more than 80 km) are double those in the lower hemisphere. From this there logically follows the advisability of attacking the adversary from below and head on. The conditions for such an attack are created by another aircraft or decoy group, which by its maneuvers "leads" the adversary into a favorable position. Hence, as foreign experts note, a new requirement on airborne dispositions: open up vertically to the greatest possible extent while maintaining tactical coordination. The attack group (aircrew) is positioned below, and the decoy group above, which has freedom of both vertical and horizontal movement, which is essential in order to escape from an adversary who has commenced pursuit.

Nor are combat dispositions with such a distribution of functions between groups (aircrews) of different tactical designation anything new; it has merely been further refined. A series of articles under the heading "How Air Combat Has Changed," published in the journal AVIATSIYA I KOSMONAVTIKA in 1979, discussed air dispositions consisting of a decoy group, an attack group, and a reserve (a group standing by to build up offensive effort). These articles mentioned Phantom attacks from below, from airborne ambush. What was being analyzed then, however, was combat by second-generation fighters, which could not attack "head on," which always approached the target from the rear, in order to employ close-range weapons.

Foreign experts note that the all-aspect attack, in spite of the complexity of its execution and dependence on many hindering factors, has established itself as a new element in air combat tactics. It has a future. At the present time, however, such an attack requires thorough preparation, in which other aircraft participate. This involves restricting maneuver by the target, which usually does not "want" to fly in a straight line. In addition, it is extremely desirable for the attacking aircraft to receive information (target designation) prior to the moment it is detected by airborne radar. In engagements fought with the participation of the F-15 (the first took place in June 1979), search functions were given over to the radar early warning aircraft.

Thus a combination of head-on attack (from the forward hemisphere) with employment of close-range weapons is considered by foreign experts to be a principal distinctive feature of aerial combat of the 1980's. Combined employment of these weapons by aircraft of different types and the mission of escorting strike aircraft define the group character of combat.

The practical aspect of this conclusion is influenced by the present situation: aircraft and weapons are prepared to fight a highly-maneuvering engagement, and it remains to ready the pilot. All the main points of theory and practice of group maneuver combat formulated during World War II are well known. Each new generation of fighters has introduced additions and corrections, but the main thing has remained unchanged. In the opinion of experts, a search for any fundamentally new paths to follow in this type of training leads only to a waste of time. (To be concluded).

3024
CSO: 9144/0035

- END -

END OF
FICHE
DATE FILMED
27 DEC. 198